INITIAL STUDY

EAST DUNNE AVENUE – BUSK RESIDENTIAL SUBDIVISION MORGAN HILL, CALIFORNIA

ZONING AMENDMENT: ZA 14-23 SUBDIVISION: SD 14-12 DEVELOPMENT AGREEMENT: DA 14-10 ENVIRONMENTAL ASSESSMENT: EA 14-24



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PREPARED FOR
CITY OF MORGAN HILL
DEVELOPMENT SERVICES CENTER DEPARTMENT
17575 PEAK AVENUE
MORGAN HILL, CA 95037

JANUARY 2016

Prepared by Geier & Geier Consulting, Inc. P.O. Box 5054 Berkeley, CA 94705-5054 510/644-2535

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CITY OF MORGAN HILL

DEVELOPMENT SERVICES CENTER DEPARTMENT

ENVIRONMENTAL CHECKLIST FORM

PROJECT INFORMATION

PROJECT TITLE:

East Dunne Avenue - Busk Zoning Amendment: ZA 14-23

Subdivision: SD 14-12

Development Agreement: 14-10 Environmental Assessment: 14-24

PROJECT LOCATION:

1390 East Dunne Avenue, west of East Dunne Avenue and north of Murphy Avenue (Figure 1)

LEAD AGENCY NAME AND ADDRESS:

City of Morgan Hill Development Services Center Department 17575 Peak Avenue Morgan Hill, CA 95037

CONTACT PERSON AND PHONE NUMBER:

Terry Linder, 408/778-6480 (email: Terry.Linder@morganhill.ca.gov)

PROPERTY OWNER:

Betty Busk 1390 East Dunne Avenue Morgan Hill, CA 95037

PROJECT APPLICANT:

Betty Busk 1390 East Dunne Avenue Morgan Hill, CA 95037

GENERAL PLAN DESIGNATION:

Single-Family Medium Density, 3-5 dwelling units/acre

ZONING:

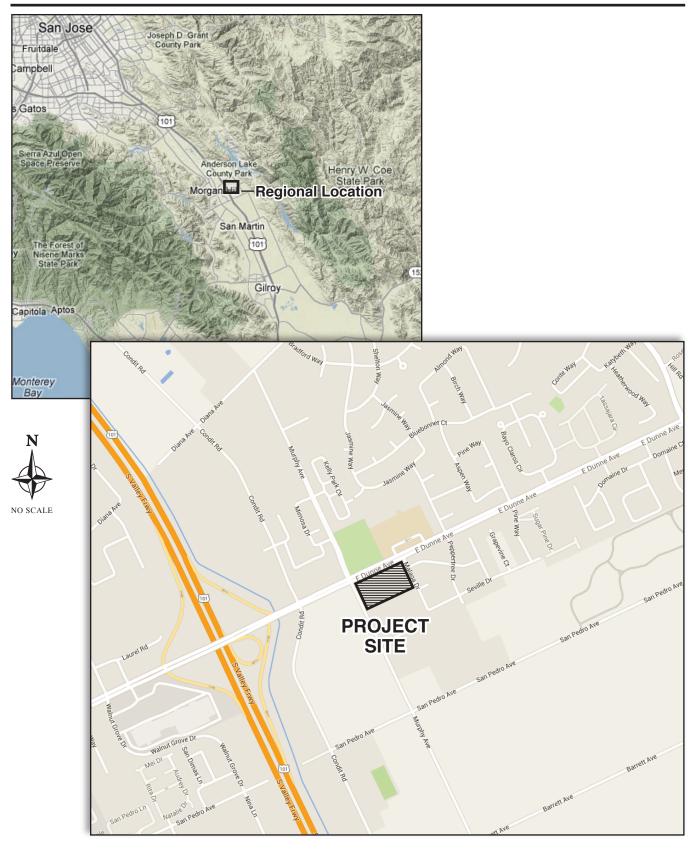
R1-7,000 RPD: Medium-Density Residential District (minimum site area per dwelling unit: 7,000 square feet)

PROJECT DESCRIPTION

Existing Setting. The 3.65-acre project site is located on the southeastern corner of the intersection of East Dunne and Murphy avenues,, within an urbanized portion of Morgan Hill. **Figure 1** shows the location of the project site. The subject property is comprised of one parcel (APN 817-19-044) that has been historically used for agricultural purposes.

The subject property is nearly level, with a slight slope to the east, with elevations ranging from approximately 361 above mean sea level at the northwestern corner of the site to 359 feet at the southeastern corner. The project site is currently developed with two residences, several outbuildings: a barn, a water tower structure, and sheds. The project site has a General Plan designation for Single-Family Medium Density use of 3 to 5 dwelling units per acre. Zoning for the project site is R1-7,000 the same residential zoning district as adjoining properties to the south and east. **Figures 2 and 3** present an aerial view of the project site and land uses in the project vicinity, indicating existing conditions on the subject property. **Figures 4 and 5** indicate the General Plan land use designations and zoning for the site and vicinity, respectively.

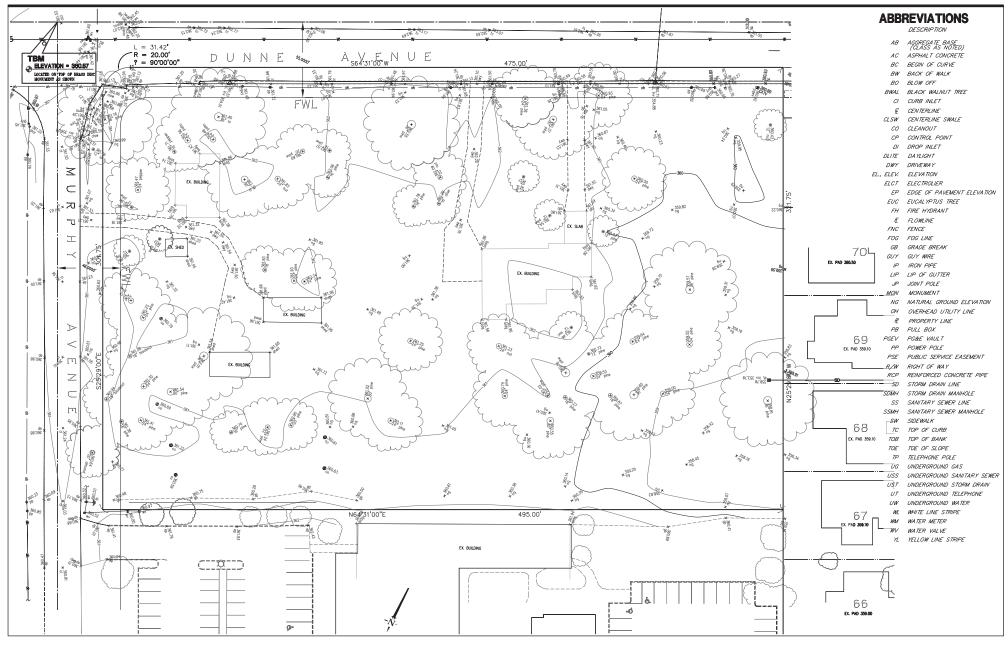
Project Location Figure 1



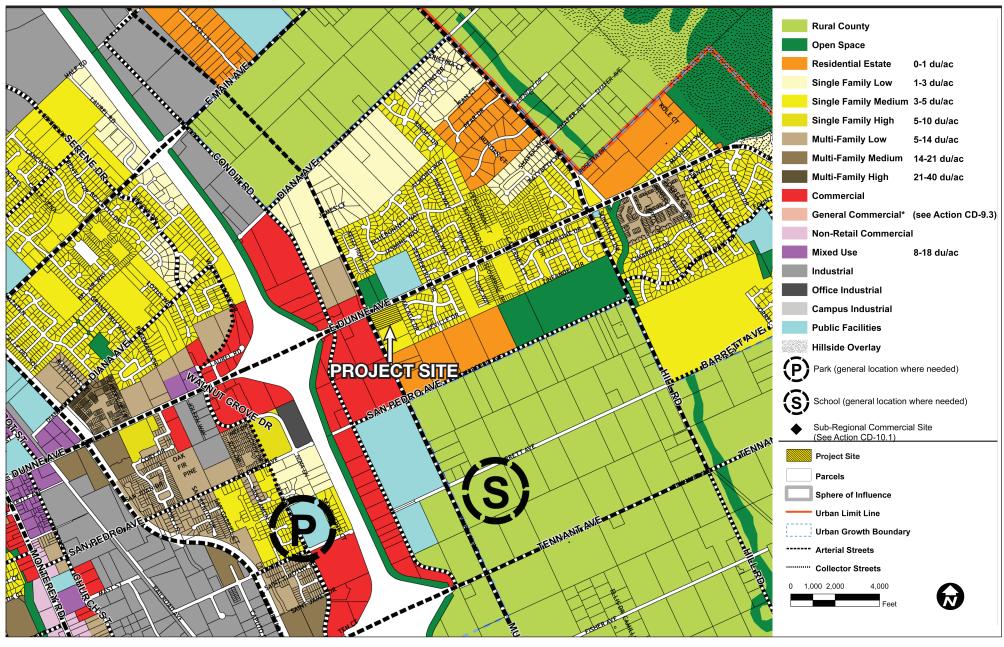




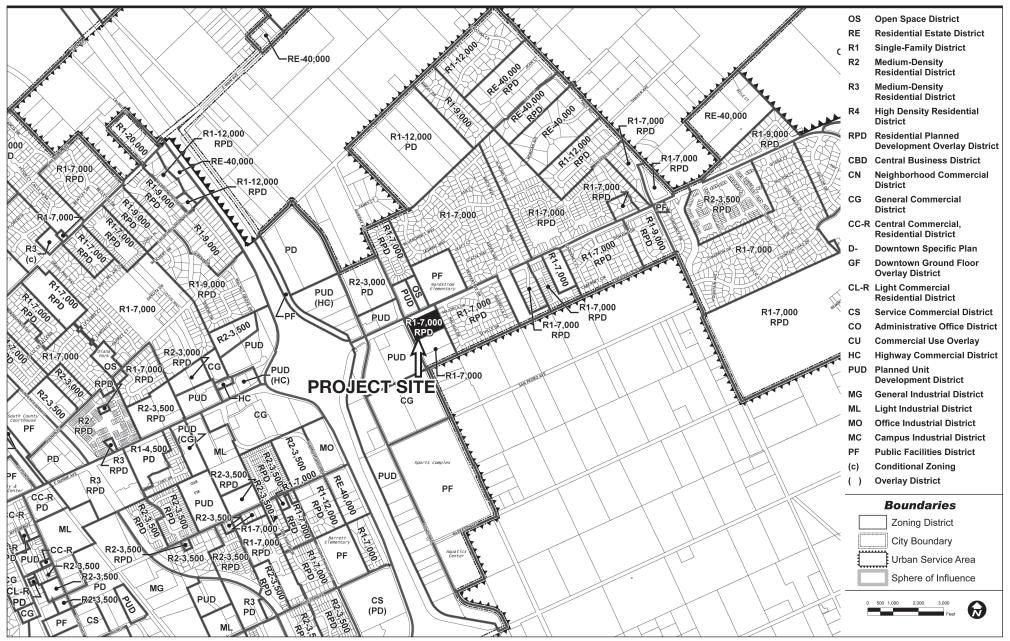














Regional access to the project site is available from State Highway 101, located approximately 0.3 mile west of the project site. Local access to the site is provided by East Dunne Avenue and Murphy Avenue. East Dunne Avenue extends along the site's northern boundary, while Murphy Avenue extends along the site's western boundary. Residential uses currently adjoin the eastern project boundary and a church (Advent Lutheran) adjoins the southern project boundary, fronting on Murphy Avenue. The City's Nordstrom Park is located on the northeast corner of the East Dunne/Murphy Avenue intersection, across from the project site. Nordstrom Elementary School adjoins the park to the east and is also immediately north of the project site. Land uses in the vicinity of the proposed residential development are indicated on the aerial view of the project site in Figure 2.

Proposed Residential Development. The project applicant is requesting approval for the following on the 3.65-acre site (APN 817-19-044):

- Subdivision of the project site into 14 residential lots;
- Construct 10 detached single-family residences, retain 2 existing single-family residences, and build 2 single-family attached residential units; and
- Retain 0.31 acre (13,504 s.f.) of open space on the site.

The proposed project would involve the development of a total of 12 new residences on the project site in addition to the preservation of two houses on the property. The areal extent of proposed uses on the project site would be as follows:

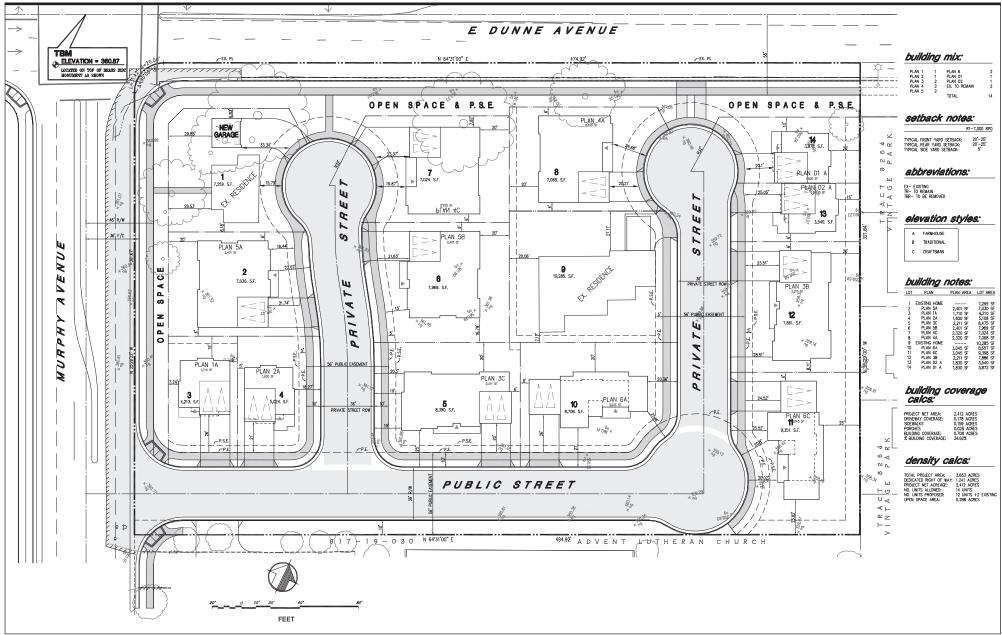
Proposed Use	Areal Extent
 Public Street Dedication (Murphy Avenue and new public street rights-of-way) 	<u>+</u> 0.65 acre
Private Drives	<u>+</u> 0.45 acre
 Residential Lots 	<u>+</u> 2.24 acres
 Open Space/Detention Basin 	+0.31 acre
Total	<u>+</u> 3.65 acres

Of the 14 residences, 10 units would be new single-family detached residences, 2 residences would be duets, and 2 existing homes on the site would remain in their current locations. The 12 lots for new units (Lots 2 – 8 and , 10 - 14) would range in size from approximately 9,398 square feet (s.f.) to 4,210 s.f., while lots for the duets would be 3,517 and 4,029 s.f. (Lots 13 and 14, respectively). The 2 existing homes would be on Lot 1 (7,259 s.f.) and Lot 9 (10,285 s.f.). Floor plans for the proposed single-family detached residences range in size from 1,710 s.f. (Lot 3) to 3,045 s.f. (Lots 10 and 11). The duet residences would be 1,830 s.f. in size for each unit. All of the proposed residential units would include attached garages for two vehicles. **Figure 6** shows the proposed site plan for the residential development.

Figures 6a through **6c** present typical elevations for the proposed residences. Typical front elevations of the proposed residences would include Farmhouse, Traditional, and Craftsman style architecture as shown in Figure 6a, 6b, and 6c, respectively. The 12 proposed residences would be developed with 6 floor plans for the single-family detached units and a separate floor plan for the duet units.

As indicated in Figure 5, the project design includes development of a public street extending from Murphy Road along the southern boundary of the subject property. Two private cul-de-sac streets would extend northward from the public street extension to serve the proposed along with the public road. Secondary access to the proposed residential development would be available for emergency vehicles from East Dunne Avenue through a restricted access driveway connecting with the easternmost cul-de-sac.. Project plans include the construction of hardscape improvements such as sidewalks along East Dunne Avenue, Murphy Avenue, and the internal public and private streets of the project.

SITE DEVELOPMENT PLAN

















Proposed Open Space. The project plans include the development of 0.29-acre of open space areas along the site's frontage with East Dunne Avenue and Murphy Avenue. These open space areas would be used for underground infiltration tanks to treat and store stormwater runoff from the project development. The project HOA would be responsible for the maintenance of the open space areas and underground infiltration tanks.

SURROUNDING LAND USES

The proposed residential project would be developed on the northern portion of a 3.65-acre parcel that surrounded by urban development to the north, east, and south. As shown in Figure 2, residential uses adjoin the eastern project boundary and a church is adjacent to the site's southern boundary. Public facilities (Nordstrom Park and Nordstrom Elementary School) adjoin the project site to the north, across East Dunne Avenue. Vacant lands zoned for future commercial uses are west of the site across Murphy Avenue. The closest commercial uses to the site are the Harvest Plaza Center located on the northwestern corner of the East Dunne/Murphy Avenue intersection across from the project site, and additional retail commercial centers approximately 500 feet west of the site at the intersection of East Dunne Avenue and Condit Road. Regional access to the project site is available from SR 101 through the East Dunne Avenue interchange with SR 101, approximately 1,000 feet west of the site. Undeveloped Lands farther south of the project site are planned and zoned for Residential Estate, Rural County, and Open Space uses.

OTHER AGENCIES WHOSE APPROVAL IS REQUIRED

In addition to the City of Morgan Hill, lead agency for the proposed project, responsible agencies having discretionary approval or jurisdiction by law over natural resources affected by the project are listed as follows: None.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

	ecked below would be potentially affectively significant Impact" as indicated by	, i ,
☐ Aesthetics	☐ Agriculture Resources	
☐ Biological Resources	Cultural Resources	☐ Geology/Soils
☐ Greenhouse Gases		
☐ Land Use/Planning	☐ Mineral Resources	Noise Noise
☐ Population/Housing	☐ Public Services	☐ Recreation
☐ Transportation/Traffic	☐ Utilities/Service Systems	

DETERMINATION: (TO BE COMPLETED BY THE LEAD AGENCY)

On the	basis of this initial evaluation:	
	I find that the proposed project COULD NOT have a significant effect on the environment, a NEGATIVE DECLARATION will be prepared.	ınc
	I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.	
	I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.	
	I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attache sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.	d
	I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIF or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revision or mitigation measures that are imposed upon the proposed project, nothing further is required.	ed ons
Terry	Linder, Senior Planner Date	

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ENVIRONMENTAL CHECKLIST AND DISCUSSION OF IMPACTS

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
1. Aesthetics - Would the project:				
a) Have a substantial adverse effect on a scenic vista?				\boxtimes
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				
c) Substantially degrade the existing visual character or quality of the site and its surroundings?				
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?			\boxtimes	

1a. Scenic Vistas

The project site consists of approximately 3.65 acres of level land at the southeast corner of the intersection of East Dunne Avenue and Murphy Avenue, within an urbanized portion of Morgan Hill. The subject property is comprised of one parcel (APN 817-19-044) that has been historically used for agricultural purposes; there are several structures on the site, including two residences, outbuildings, a barn, a water tower structure, and sheds. The site slopes slightly to the east, with elevations ranging from approximately 361 above mean sea level at the northwestern corner of the site to 359 feet at the southeastern corner. Mature trees occur extensively throughout the project site, as can be noted in Figures 2 and 3. Trees along the property's frontage on East Dunne Avenue and Murphy Avenue provide screening and filtered of views of the property from the these two streets.

Land uses surrounding the project site include residential and commercial development, public facilities and open space, and agricultural uses. Surrounding development occurs on level properties similar to the site. Views of the project site are principally available to the public from East Dunne Avenue and Murphy Avenue adjoining the subject property, and Nordstrom Park immediately north of the site. Private views of the project site are available from the residential uses to the east on Malaga Drive and the church to the south. Wooden fencing and landscaping in the rear and side yards of residences along Malaga Drive separate adjoining residential uses from the project site.

Due to the site vicinity's distance from the Santa Cruz Mountains to the west and the Diablo Range to the east, potential views of scenic vistas are limited to low ridgelines that occur on the distant horizon. These ridgelines constitute a small component of views that are available to motorists and affected residents in the project area. Motorists traveling west on East Dunne Avenue near the site have a distant view of El Toro Mountain to the west of the subject property; however, these views are screened by mature street trees along East Dunne Avenue adjoining Nordstrom Park and the Harvest Plaza Shopping Center. Similarly, views of the Diablo Range ridgeline for motorists travelling east on East Dunne Avenue are blocked by project site trees and street trees in the East Dunne Avenue median. Views of the Diablo Range ridgeline for travelers on Murphy Avenue are also screened or blocked by extensive streetside landscaping and mature trees on the project site and Nordstrom Park. The residences proposed by the project would replace site trees and, depending on building locations and height, may provide additional views of the distant Diablo Range ridgeline to the public.

In addition to the travelling public, views of and across the project site are available from the single- and two-story homes on Malaga Drive. Rear yard views from the five homes adjoining the project site are

comprised of the backyard fencing and landscaping. Views from these home also include the site's extensive landscape trees and an open ruderal area that is disced for vegetation control. The proposed project would replace the project site's trees with two single-family homes and two duet units that would back onto the project site's eastern boundary. Backyard fencing and future landscaping on the project site would result in screening of private views from the adjoining residences on Malaga Drive. Consequently, the proposed project would have no significant adverse effects on scenic resources.

1b. Scenic Resources Within a State Scenic Highway

There are no state-designated scenic highways in the project vicinity and, therefore, the project would not affect scenic resources within a state scenic highway.

1c. Visual Character

The visual quality and character of the project site is defined by its current use as a rural residential property, while the visual character of the project area setting is formed by the suburban residential and commercial uses surrounding the project site. Open agricultural lands and rural residential lots to the south and west of the subject property contribute to the semi-rural character of the project vicinity. Private views of the project site that define its visual character are primarily available from side and rear yards of residences on Malaga Drive adjoining the subject property. Public views of the project site are available to travellers on East Dunne and Murphy avenues.

The development of the project site with 12 new single-family residential units would change the character of the project site from semi-rural residential to suburban residential uses. The project proposal entails the removal of all trees on the project site to accommodate the development of the project residences. Information regarding the numerous trees on the site was compiled by Morgan Hill Tree Service and presented in the arborist's report dated April 11, 2015.

The City of Morgan Hill recognizes the importance of trees to the community and has established policies and guidelines for the preservation of native plants in the City's Open Space and Conservation Element of the General Plan. These guidelines are implemented through Chapter 12.32 of the City Municipal Code, Restrictions on Removal of Significant Trees. Section 12.32.020 of the Code defines the type of plant that qualifies as a "tree" and the legal protection afforded to such resources.

Based upon this definition, 23 of the 44 trees surveyed on the project site would qualify for protection under Chapter 12.32 of the City's Municipal Code and a permit would be required for the removal of these trees. The arborist's report indicates that most of the trees at this site are between 40 and 60 years old and that very little maintenance appears to have been performed on the trees over the years since the lot was first developed. Consequently, most of the trees have developed structural and health problems that would make preservation difficult and costly.

In brief, the arborist's report identifies 44 significant trees of various species and physical characteristics on the site. Of these 44 trees, 16 trees are recommended for retention pending the final project design and lot configuration, while 28 of the significant trees have substantial health issues and/or conflict with the construction of proposed residences. A review of the Tree Inventory Map for the proposed project indicates that eight 8 of these 16 trees may be compatible with the propose project development (Trees #3,7,14,19,26-28, and 41). The retention of these trees would ameliorate the potential losses of the

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Morgan Hill Tree Service, 2015. Arborist's Report for Busk Property at Murphy Ave. and E. Dunne Ave., Morgan Hill. April 11.

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remaining 36 significant trees and assist in the retention of the project site's present visual character.

The project's proposed residential units would be consistent with the existing residential development to the east and north of the site. With current project plans, the visual character of the site as seen from the residences on these streets would be replaced by rear yard and side yard views of the single-family homes and duet units proposed for the project site.

Proposed street tree planting would moderate views of the project's two-story residences from East Dunne Avenue, Murphy Avenue, and the project's internal public and private roadways. The landscaping plans for the project include street trees along these two streets and the public road proposed for the project development. Views of the project site from the adjoining church would be also be moderated by street tree and lot landscaping along the site's proposed public street and Lots 3-5, 10, and 11. The visual character of the site would change from one of agricultural or semi-rural to suburban residential use. This change in visual character would be consistent with the existing character of the surrounding neighborhood, as defined by residential uses along East Dunne Avenue and Malalga Drive to the east and Murphy Avenue and Condit Drive to the north. Consequently, the proposed project would not substantially degrade the existing visual character or quality of the site and its surroundings.

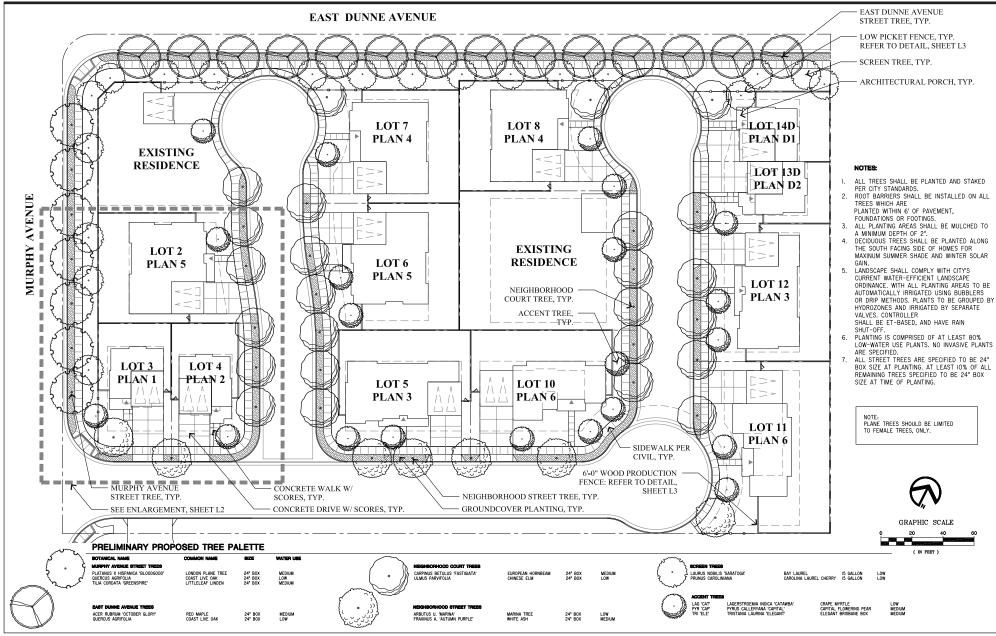
The project's landscaping plan, shown in **Figure 7**, does not include rear yard tree plantings for any of the proposed lots and views of the site from the backyards of residences along Malaga Drive would change from a semi-rural to suburban character. To ameliorate this transition, the project's proposed landscaping plan should be modified to include landscape trees along the site's eastern boundary with these residences as a Standard Condition of Approval.

The loss of 23 protected trees would be offset with the planting of 93 landscape trees throughout the project site, an approximate replacement ratio of 4:1 for the project. However, the replacement landscape trees will differ substantially from the physical character of the removed site trees, changing the character o the site. To moderate the transition of the site's visual character to a more suburban appearance, a second Condition of Approval for the proposed project should include a re-evaluation of eight protected trees that could be retained on the site through possible adjustments to the project design.

1d. Light or Glare

The project site is undeveloped and there are no sources of light or glare. The development of a new public street and private drives as well as additional housing on the site would introduce new light sources at the site. Proposed exterior lighting for new residences will need to conform to the design standards stipulated by City Building Code, which will ensure that project lighting would not adversely affect adjacent properties.

Preliminary Landscape Plan Figure 7





Issues (and Supporting Information Sources)	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
2. Agriculture and Forestry Resources – In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Dept. of Forestry and Fire Protection regarding the state's inventory of forest land, and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?			\boxtimes	
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				\boxtimes
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined in Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				\boxtimes
d) Result in the loss of forest land or conversion of forest land to non-forest use?				\boxtimes
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?				\boxtimes

Less than

2a, 2b, 2c, 2d, 2e. Farmland, Agricultural, and Forestry Uses

The City of Morgan Hill General Plan currently designates the project site for single-family residential development and is also zoned for this use. The 3.65-acre project site is presently supports two homes and associated outbuildings. The project site is located contiguous to suburban residential properties and a church. Given the small size of this parcel, current residential uses immediately adjacent to the property, current zoning, and the extensive residential development to the north and east of the project site, project development would have a less-than-significant effect on the conversion of the site to a non-agricultural use. It should be noted that the City formulated agricultural policies and prepared an implementation program to guide the conservation of agricultural lands within the City's Sphere of Influence area.² The

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² City of Morgan Hill, 2011. Morgan Hill Agricultural Policies and Implementation Program. December 22.

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City has designated agricultural lands in the Southeast Quadrant of the community for conservation and continued agricultural use.

Less than

Issues (and Supporting Information Sources)	Potentially Significant Impact	Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
3. Air Quality - Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?				\boxtimes
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?			\boxtimes	
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?			\boxtimes	
d) Expose sensitive receptors to substantial pollutant concentrations?		\boxtimes		
e) Create objectionable odors affecting a substantial number of people?				\boxtimes

3a. Air Quality Planning

The San Francisco Bay Area Air Basin (SFBAAB) is classified by the Bay Area Air Quality Management District (BAAQMD) as non-attainment for ozone and inhalable particulates (PM₁₀). To address these exceedances, the BAAQMD, in cooperation with the MTC and ABAG, prepared the *Bay Area 2005 Ozone Strategy (BAOS)* in September 2005 and *Particulate Matter Implementation Schedule (PMIS)* in November 2005. The PMIS discusses how the BAAQMD implements the California Air Resources Board's 103 particulate matter control measures. The most recently adopted air quality plan in the Basin is the *2010 Bay Area Clean Air Plan (CAP)*. This *CAP* outlines how the SFBAAB will attain air quality standards, reduce population exposure and protect public health, and reduce greenhouse gas (GHG) emissions.

The consistency of the proposed project with the most recently adopted regional air quality plan, the *CAP*, is determined by comparing the project's consistency with pertinent land use and transportation control measures contained in the *CAP*. Pertinent measures relate to evaluating impacts according to the BAAQMD's CEQA Guidelines (impact evaluation presented below).

The project's construction-related and operational emissions were determined to not exceed the BAAQMD's CEQA significance thresholds for criteria air pollutants and diesel particulate matter. Therefore, the proposed project's emissions would be consistent with the BAAQMD's *CAP* (the most recently adopted regional air quality plan). The consistency of the proposed project with the most recently adopted regional air quality plan, the *CAP*, is also determined by comparing the project's consistency with the Morgan Hill General Plan. Since the *CAP* is based on population projections of the Association of Bay Area Governments (ABAG) that are based on the City's General Plan in effect at the time the *CAP* was approved, consistency of the project with the General Plan would indicate consistency with the *CAP*. The project would be consistent with the use and density allowed on the project site by the Morgan Hill General Plan, and therefore, the project would be consistent with the *CAP*, a less-than-significant impact.

3b. Air Quality Standards

Regulatory and Planning Framework. The BAAQMD is responsible for attaining and/or maintaining air quality in the San Francisco Bay Area Air Basin (SFBAAB) within Federal and State air quality standards. Specifically, the BAAQMD has the responsibility to monitor ambient air pollutant levels throughout the Basin and to develop and implement strategies to attain the applicable Federal and State standards. In June 2010, the BAAQMD adopted CEQA thresholds of significance and updated its CEQA Air Quality Guidelines, which provides guidance for assessing air quality impacts under CEQA. However, on March 5, 2012, the Alameda County Superior Court issued a judgment finding that the BAAOMD had failed to comply with CEOA when it adopted the Thresholds. The court issued a writ of mandate ordering the BAAOMD to set aside the Thresholds and cease dissemination of them until the BAAQMD had complied with CEQA. On August 13, 2013, the California Court of Appeal reversed the Alameda County Superior Court judgment that invalidated the BAAOMD's CEOA thresholds of significance. The Court directed that the Superior Court vacate the writ of mandate issued in March 2012, ordering the BAAQMD to set aside its June 2010 resolution (Res. #2010-06) "Adopting Thresholds for Use in Determining the Significance of Projects' Environmental Effects Under the California Environmental Quality Act." Although the California Supreme Court has granted review in the litigation to hear one particular issue of law, the granting of review does not alter the result in the Court of Appeal, though the latter court's decision is no longer a published, citable precedent. And the legal cloud created by the trial court decision no longer exists. Local agencies such as the City of Morgan Hill may rely on the BAAQMD thresholds.

Significance Thresholds. Exercising its own discretion as lead agency and similar to multiple other San Francisco Bay Area jurisdictions, the city staff has decided to rely on the thresholds within the *Options and Justification Report* (dated October 2009) prepared by the BAAQMD.³ The BAAQMD *Options and Justification Report* establishes thresholds based on substantial evidence and are consistent with the thresholds outlined within the 2010/2011 BAAQMD CEQA Air Quality Guidelines. The thresholds have been developed by the BAAQMD in order to attain state and national ambient air quality standards. Therefore, projects below these thresholds would not violate an air quality standard and would not contribute substantially to an existing or projected air quality violation:

NO_x and ROG: 54 pounds/day

PM10: 82 pounds/dayPM2.5: 54 pounds/day

In addition to establishing the above significance thresholds for criteria pollutant emissions, the BAAQMD, in its *Options and Justification Report*, also recommended the following quantitative thresholds to determine the significance of construction-related and operational emissions of toxic air contaminants from individual project and cumulative sources on cancer and non-cancer health risks:

- Increased cancer risk of >10.0 in a million for individual projects and >100 in a million (from all local sources) for cumulative sources;
- Increased non-cancer risk of >1.0 Hazard Index (Chronic or Acute) for individual projects and >10.0 Hazard Index (from all local sources) for cumulative sources; and
- Ambient PM_{2.5} increase: >0.3 μ g/m³ annual average for individual projects and >0.8 μ g/m³ annual average (from all local sources) for cumulative sources.

³ Bay Area Air Quality Management District, 2009. *Revised Draft Options and Justification Report*. October. Available online at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Updated-CEQA-Guidelines.aspx.

Project Emissions. The project's construction-related and operational emissions are estimated and compared to the above significance thresholds in **Table 1**. As shown in this table, the project's construction-related and operational air pollutant emissions would not exceed the BAAQMD significance thresholds for criteria pollutants, a less-than-significant impact. However, the BAAQMD recommends that all Basic Construction Mitigation Measures be implemented for all construction projects, whether or not construction-related emissions exceed these significance thresholds. Therefore, the project's construction-related and operational increases in criteria pollutant emissions would be less than significant with implementation of Mitigation Measure AQ-1.

3c. Cumulative Air Quality Impacts

To address cumulative impacts on regional air quality, the BAAQMD has established thresholds of significance for construction-related and operational criteria pollutants and precursor emissions. These thresholds represent the levels at which a project's individual emissions of criteria pollutants and precursors would result in a cumulatively considerable contribution to the SFBAAB's existing air quality conditions. If daily average or annual emissions exceed these thresholds, the project would result in a cumulatively significant impact. Since the project's construction-related and operational criteria pollutant emissions would not exceed BAAQMD significance thresholds (as indicated in Table 1), the project's contribution is considered to be less than cumulatively considerable, and therefore, less than significant.

In addition, when the project's construction-related diesel particulate matter (DPM) emissions are considered with other existing stationary and mobile sources of toxic air contaminants (TACs), the project's contribution to cumulative emissions would not contribute to cumulative construction-related risk and hazard impacts would not be cumulatively considerable, a less-than-significant impact (see Section 3d below for more discussion).

3d. Exposure of Sensitive Receptors

The California Air Resources Board (CARB) regulates vehicle fuels with the intent to reduce emissions. Diesel exhaust is a serious concern throughout California. The CARB identified diesel engine particulate matter as a toxic air contaminant and human carcinogen. The exhaust from diesel engines includes hundreds of different gaseous and particulate components, many of which are toxic. Many of these toxic compounds adhere to the diesel particles, which are very small and can penetrate deeply into the lungs. Diesel engine particulate matter has been identified as a human carcinogen. Mobile sources such as trucks, buses, and automobiles are some of the primary sources of diesel emissions. Studies show that diesel particulate matter concentrations are much higher near heavily traveled highways and intersections. The cancer risk from exposure to diesel exhaust is much higher than the risk associated with any other toxic air pollutant routinely measured in the region. Diesel exhaust contains both pulmonary irritants and hazardous compounds that can affect sensitive receptors such as young children, senior citizens, or those susceptible to chronic respiratory disease such as asthma, bronchitis, and emphysema.

In 2005, the CARB approved a regulatory measure to reduce emissions of toxic and criteria pollutants by limiting the idling of new heavy-duty diesel vehicles, which altered five sections of Title 13 of the California Code of Regulations. The changes relevant to the proposed project are in Section 2485, Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling, which limit idling of a vehicle's primary diesel engine for greater than five minutes in any location (with some exceptions) or operation of a diesel-fueled auxiliary power system within 100 feet of residential areas.

Sensitive receptors are defined as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. The CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65, children under 14, athletes, and persons with cardiovascular and chronic

respiratory diseases such as asthma, emphysema, and bronchitis. Adjacent residences are considered to be the closest sensitive receptors to project construction.

TABLE 1
PROJECT-RELATED CONSTRUCTION AND OPERATIONAL CRITERIA POLLUTANT EMISSIONS

	Average Daily Emissions (pounds/day)					
					PM10	PM2.5
Project Activity	ROG	NO_X	CO	SO_2	(Total)	(Total)
Project Construction (Off-Road Equipment Emissions ^a)						
– 2016 – No Mitigation	3.7	38.5	26.9	0.0	8.9	5.4
– 2016 – With Mitigation Measure AQ-2	3.7	38.5	26.9	0.0	3.0	1.7
– 2017 – No Mitigation	22.9	26.5	18.4	0.0	1.8	1.7
– 2017 – With Mitigation Measure AQ-2	22.9	26.5	18.4	0.0	1.0	0.8
Significance Thresholds	54	54	-	-	82	54
Exceeds Significance Thresholds?	No	No	-	-	No	No
Project Operation ^b						
 Area Source Emissions 	0.7	0.0	1.0	0.0	0.0	0.0
Energy Emissions	0.0	0.1	0.0	0.0	0.0	0.0
 Mobile Source Emissions 	0.4	0.9	3.8	0.0	0.6	0.2
Total	1.1	1.0	4.9	0.0	0.6	0.2
Significance Thresholds	54	54	-	-	82	54
Exceeds Significance Thresholds?	No	No	_c	_d	No	No
	A	verage A	nnual l	Emissio	ns (tons/y	ear)
					PM10	PM2.5
Project Activity	ROG	NO_{X}	CO	SO_2	(Total)	(Total)
Project Construction (Off-Road Equipment Emissions ^a)						
– 2016 – No Mitigation	0.4	3.5	2.3	0.0	2.3	0.2
– 2016 – With Mitigation Measure AQ-2	0.4	3.5	2.3	0.0	0.1	0.1
– 2017 – No Mitigation	0.4	0.2	0.2	0.0	0.0	0.0
– 2017 – With Mitigation Measure AQ-2	0.4	0.2	0.2	0.0	0.0	0.0
Significance Thresholds	10	10	-	-	15	10
Project Operation						
 Area Source Emissions 	0.1	0.0	0.1	0.0	0.0	0.0
Energy Emissions	0.0	0.0	0.0	0.0	0.0	0.0
 Mobile Source Emissions 	0.1	0.2	0.7	0.0	0.1	0.0
– Waste	0.0	0.0	0.0	0.0	0.0	0.0
- Water	0.0	0.0	0.0	0.0	0.0	0.0
Total	0.2	0.2	0.8	0.0	0.1	0.0
Significance Thresholds	10	10	-	-	15	10
Exceeds Significance Thresholds?	No	No	-	-	No	No

NOTES: ROG = reactive organic gases; NO_X = nitrogen oxides; CO = carbon monoxide; SO_2 = sulfur dioxide; exhaust PM_{10} = particulate matter less than 10 microns; exhaust $PM_{2.5}$ = particulate matter less than 2.5 microns.

SOURCE: CalEEMod Output (see Attachment 1)

a Construction assumptions: Demolition would occur over 10 days using 1 concrete saw, 1 dozer, 1 excavator; grading would occur over 8 days using 1 excavator, 1 grader, 1 dozer, and 3 loaders/backhoes; construction of 12 homes would occur over 230 work days using 1 crane, 3 forklifts, 1 generator set, 3 loaders/backhoes, and 1 welder; and paving would occur over 18 work days using 2 cement mixers, 2 pavers, 1 paving equipment, 2 rollers, and 1 loader/backhoe.

b CO: If localized carbon monoxide estimated emissions exceed 550 pounds/day, more detailed analysis is required. Therefore, emissions below this threshold indicate that CO emissions would be less than significant.

c SO₂: The SO₂ state and federal standards are currently being met throughout the Bay Area and have been met in recent decades. Therefore, the project's estimated emissions would be less than significant.

Operation of the proposed residential use would not generate toxic air contaminants (TACs) that would pose a health risks to adjacent or nearby uses. However, during project construction, combustion emissions from operation of off-road construction equipment on the project site would be generated and could expose adjacent and nearby receptors to diesel particulate matter (DPM) and other toxic air contaminants (TACs) that are associated with various health risk factors. Due to the proximity of sensitive receptors to the project site, a screening-level construction-related health risk analysis was completed for the project and impacts on nearby sensitive receptors from DPM emissions. The results of the health risk screening are summarized in **Table 2**. As indicated in this table, the project's construction-related DPM emissions would not exceed BAAQMD significance thresholds for cancer and non-cancer health risks for infants (up to 2 years in age), which have the highest age sensitivity factor (ASF). Therefore, the project's construction-related DPM emissions would result in a temporary, less-than-significant health risk to infants and no mitigation would be required.

TABLE 2

CANCER RISK AND CHRONIC NON-CANCER HEALTH RISKS AT THE CLOSEST SENSITIVE RECEPTORS
DUE TO DPM EXPOSURE DURING PROJECT CONSTRUCTION

PM _{2.5} Exposure, Excess Cancer Risk, ^a and Non-Can Chronic Hazard Index from Project Construction					
	Activities at Closest Receptors				
Parameter	Without Mitigation	With Mitigation			
Maximum One-Hour PM _{2.5}	$3.067 \ \mu g/m^3$	$1.447 \ \mu g/m^3$			
Annual Average PM _{2.5} (one-hour x 0.1)	$0.3067 \ \mu g/m^3$	$0.1447 \ \mu g/m^3$			
Annual Average PM _{2.5} Significance Threshold	$0.3 \mu g/m^3$	$0.3 \ \mu g/m^3$			
Exceeds Significance Threshold?	Yes	No			
Age-Weighted Excess Risk for Infants	13.14 in a million	6.20 in a million			
Children	3.94 in a million	1.86 in a million			
Adults	1.31 in a million	0.62 in a million			
Cancer Risk Significance Threshold	Excess Cancer Risk >10 x 10 ⁻⁶	Excess Cancer Risk >10 x 10 ⁻⁶			
Exceeds Threshold?	Yes	No			
Chronic / Acute Non-Cancer Hazard Index	0.061 / 0.357	0.029 / 0.168			
Chronic Non-Cancer Significance Threshold	Hazard Index >1.0	Hazard Index >1.0			
Exceeds Threshold?	No	No			

NOTES:

SOURCES: A screening-level individual cancer analysis was conducted to determine the maximum PM2.5 concentration from diesel exhaust. This concentration was combined with the DPM exposure unit risk factor to calculate the inhalation cancer risk from project-related construction activities at the closest sensitive receptor. The EPA AERSCREEN air dispersion model was used to evaluate concentrations of DPM and PM2.5 from diesel exhaust. The AERSCREEN model was developed to provide an easy to use method of obtaining pollutant concentration estimates and is a single source Gaussian plume model which provides a maximum one-hour ground-level concentration. The model output for this analysis is included in the **Attachment 2** of this report.

The predicted maximum one-hour DPM concentration is 3.067 μg/m³ resulting from on-site total project DPM emissions of 0.2347 tons. With implementation of Mitigation Measure AQ-2 (watering times per day and use of diesel particulate filters on large construction equipment, >75 HP), the predicted maximum one-hour DPM concentration is 1.447 μg/m³ resulting from on-site total project DPM emissions of 0.0919 tons. The hourly to annual scaling factor is 0.1. AERSCREEN output thus indicates that project construction would produce a maximum annual DPM concentration of 0.3067 μg/m³ without mitigation and 0.1447 μg/m³ with mitigation.

b The excess individual cancer risk factor for DPM exposure is approximately 300 in a million per 1 μg/m³ of lifetime exposure (DPM (μg/m³) x ASF x 300 x 10-6) / 70 years. More recent research has determined that young children are substantially more sensitive to DPM exposure risk. If exposure occurs in the first several years of life, an age sensitivity factor (ASF) of 10 should be applied. For toddlers though mid-teens, the ASF is 3.

In addition to the above construction-related risk and hazard impacts, sensitive receptors in the project vicinity would be exposed to cumulative risk and hazard impacts from the project's construction-related emissions in combination with existing stationary and mobile sources within approximately 1,000 feet of the project area. Therefore, in addition to project construction, possible local stationary or vehicular source emissions must be added to this concentration to determine the cumulative total. Specifically, the BAAQMD requires that existing stationary and mobile emissions sources (i.e. freeways or roadways with more than 10,000 vehicles per day) within 1,000 feet of the project area also be considered. Any potential cumulative health risk would, therefore, derive from project activities plus any existing identified risk sources within the project vicinity. According to BAAOMD records, there are no permitted sources within 1,000 feet of the project site, but there is one roadway within 1,000 feet of the site with average daily traffic volumes exceeding 10,000. As shown in Table 3, when emissions from these existing sources are added to project emissions, cumulative emissions would not exceed the cumulative significance thresholds for risk and hazard impacts at new sensitive receptors or the MEI. With implementation of Mitigation Measure AQ-2 to address project-level health risks, cumulative emissions would be even lower and also less than significant. Therefore, the project's contribution to cumulative construction-related risk and hazard impacts would be less than cumulatively considerable, a less-thansignificant impact.

TABLE 3
CUMULATIVE RISK AND HAZARD IMPACTS

Existing Mob	pile Sources					
Direction	Roadways with ADT of >10,000	Distance ^b	ADT	Excess Cance	er Risk ^c	PM2.5 (μg/m ³)
E-W	East Dunne Avenue	100 feet	14,319	4.98		0.126
Proposed Pro	oject Sources (Worst Case)					
			Excess Cancer Risk	Chronic Hazard Index	Acute Hazard Index ^d	PM2.5 (μg/m ³)
Total – Un	imitigated Project Sources (see	Table 2 Above)	13.14	0.061	0.357	0.3067
To	otal – Unmitigated Maximum C	Cumulative Risk	18.12	0.061	0.357	0.4327
Total –	Mitigated Project Sources (see	Table 2 Above)	6.20	0.029	0.168	0.1447
	Total – Mitigated Maximum C	umulative Risk	11.18	0.029	0.168	0.2707
	Cumulative Significa	nce Thresholds	100	1	1	0.8
	Exce	eds Threshold?	No	No	No	No

NOTES:

3e. Odors

According to the BAAQMD CEQA Guidelines, land uses associated with odor complaints typically include wastewater treatment plants, landfills, confined animal facilities, composting stations, food manufacturing plants, refineries, and chemical plants. The project would not include any uses identified by the BAAQMD as being associated with odors. No new or unusual sources of nuisance odors would be associated with the proposed residence. Therefore, the project's potential for nuisance odor problems would be less than significant.

^a Cancer cases in a million

b Distance to Maximally-Exposed Individual, which is on Calle Sueño (to the west).

^c Interpolated for this site-specific distance and ADT.

d Based upon the ratio of speciated organic gases to DPM in diesel exhaust relative to peak 1-hour concentrations. SOURCE: BAAQMD Roadway Screening Analysis Calculator, April 16, 2015. Available online at http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools.

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During project construction, however, nuisance diesel odors associated with operation of diesel construction equipment on-site (primarily during initial grading phases), but this effect would be localized, sporadic, and short-term in nature. Therefore, temporary impacts from nuisance diesel odors on adjacent residential receptors would be less than significant.

Mitigation Measures – Air Quality (AQ)

Although the project's construction-related air pollutant emissions would not exceed the BAAQMD's applicable significance thresholds, the following measures are recommended by the BAAQMD to reduce the project's construction emissions:

- **AQ-1:** Basic Construction Measures. To limit the project's construction-related dust and criteria pollutant emissions, the following BAAQMD-recommended Basic Construction Mitigation Measures shall be included in the project's grading plan, building plans, and contract specifications:
 - a. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
 - b. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
 - c. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
 - d. All vehicle speeds on unpaved roads shall be limited to 15 mph.
 - e. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible.
 - f. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
 - g. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
 - h. Post a publicly visible sign with the telephone number and person to contact at the City regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.
- AQ-2: Enhanced Particulate Controls. Any diesel-powered dozers, graders, loader/backhoes, excavators, and cranes (> 75 HP) used during project construction shall be equipped with diesel particulate filters to reduce particulate emissions and associated health risks to infants. In addition, all exposed surfaces shall be watered three times per day rather than twice per day as listed above under Basic Construction Measures.

Issues (and Supporting Information Sources)	Potentially Significant Impact	Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
4. Biological Resources - Would the project: a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?			\boxtimes	

	Potentially Significant	Significant Impact With Mitigation	Less Than Significant	No
Issues (and Supporting Information Sources)	Impact	Incorporated	Impact	Impact
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?			\boxtimes	
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?				
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?			\boxtimes	

Less than

The following evaluation of biological resources on the subject property derives from Biological Resources Report⁴ prepared by Mosaic Associates, LLC in October 2015 (included as **Attachment 3**). Information regarding the numerous trees on the site was compiled by Morgan Hill Tree Service and presented in the arborist's report⁵ dated April 11, 2015 (included as **Attachment 4**). In addition to the assessment of the biological resources on the project site, these reports include recommendations for the preservation and conservation of these resources through project site design.

4a, 4b, 4c, 4d. Special-Status Species, Sensitive Natural Communities and Wetlands, Protected Wetlands, Fish and Wildlife Movement, Corridors, Nursery Sites

The 3.65-acre project site (APN 817-19-044) is located at 1390 E. Dunne Avenue in Morgan Hill, east of Highway 101. Two residences and several outbuildings are present on the subject property. The original farmhouse is located south of the intersection of E. Dunne and Murphy Avenues and a second house is located near the center of the property. Landscaping and a vegetable garden, and piles of woody debris are also present on the property.

Remnants of an old walnut orchard are present to the east of the second house. Numerous trees are present on the project site. As noted in the Arborist Report (M. Smith, 4/11/15), most of the trees on the property are between 40 and 60 years old. Many of the trees are dead or in poor health, and are poorly maintained. Portions of the property have been disced to abate fire hazard, including a strip along the southern boundary of the site and in the old orchard on the east side of the property.

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⁴ Mosaic Associates, LLC, 2015. Biological Resources Report for the Busk Property, 1390 E. Dunne Avenue, Morgan Hill, CA. October.

Morgan Hill Tree Service, 2015. Arborist's Report for Busk Property at Murphy Ave. and E. Dunne Ave., Morgan Hill. April 11.

Plant Communities and Wildlife Habitats. The project site consists of existing rural residential development with outbuildings, landscaping and remnants of an old orchard. Much of the site supports a relatively dense overstory of mature trees including the native coast live oak (*Quercus agrifolia*), as well as planted horticultural species such as Monterey pine (*Pinus radiata*), black walnut (*Juglans nigra*), California pepper (*Schinus molle*), loquat (*Eriobotrya* sp.), dwarf blue gum (*Eucalyptus globulus* var. *compacta*), Bailey acacia (*Acacia baileyana*), palms (Arecaceae), deodar cedar (*Cedrus deodara*), incense cedar (*Calocedrus decurrens*), Italian stone pine (*Pinus pinea*), olive (*Olea europaea*), and Douglas fir (*Pseudotsuga menziesii*). Horticultural shrubs surround the residences. Outside of the landscaped yards and disked areas, ruderal vegetation dominates the understory. Non-native grasses wild oat (*Avena fatua*) and ripgut brome (*Bromus diandrus*) as well as non-native forbs including yellow star thistle (*Centauria solstitialis*), field bindweed (*Convolvulus arvensis*), milk thistle (*Silybum marianum*), shortpod mustard (*Hirschfeldia incana*), black mustard (*Brassica nigra*), and common mallow (*Malva neglecta*). These species are common constituents of disturbed settings. The only native plants found in the understory were coast live oak seedlings and a few narrowleaf milkweed (*Asclepias fasicularis*).

No wetlands, streams or riparian habitat is present on or adjacent to the project site.

Birds observed in or flying over the site include Anna's hummingbird (*Calypte anna*), mourning dove (*Zenaida macroura*), California towhee (*Pipilo crissalis*), scrub jay (*Aphelocoma californica*), oak titmouse (*Baeolophus inornatus*), black phoebe (*Sayornis nigricans*), and turkey vulture (*Cathartes aura*). A non-native eastern fox squirrel (*Sciurus niger*) was observed on site. No ground squirrels (*Spermophilus beecheyi*) were observed although a few ground squirrel burrows were present in the northern corner of the site abutting E. Dunne Avenue.

Special-status Species. A search of published accounts for special-status plant and animal species was conducted for the Morgan Hill USGS 7.5" quadrangle in which the project site occurs and for the eight surrounding quadrangles (San Jose East, Lick Observatory, Isabel Valley, Santa Teresa Hills, Mt. Sizer, Loma Prieta, Mt. Madonna, and Gilroy) using the CNDDB Rarefind 5 application (CDFW 2015). Figure 3 shows the locations of special-status species within 3.1 miles of the Project site. Of the 71 special status plant and animal species recorded from the region, only three have any potential to occur within the Project site. Special-status species with potential to occur on the Project site include burrowing owl (*Athene cunicularia*), pallid bat (*Antrozous pallidus*) and Yuma myotis (*Myotis yumanensis*). Additional information on those species is provided below. Given the conversion of the Project site to residential use many decades ago, as well as continued disturbance from the existing residences and outbuildings, landscaping and use for agriculture (former orchard), there is no suitable habitat present for the other 68 species known from the region, and they are not considered further in this report.

Plant Species. Approximately 40 special status vascular plant species are known to occur in the general project vicinity (CDFG 2011). All would be expected to be absent to occur onsite due to the level of site disturbance, the lack of suitable habitat, and the low chances of dispersal to the site from source populations due to the lack of habitat connectivity. Therefore, state and federal laws protecting special status plants would not be relevant to development of the site.

Animal Species. Special-status wildlife with potential to be present in the Project site include: burrowing owl, pallid bat and Yuma myotis. Habitat for other special-status wildlife known from the region surrounding the project site is absent due to past conversion of the site to residential and agricultural use.

<u>Western Burrowing Owl</u>: Western burrowing owl (California Species of Special Concern) requires habitat with open, well-drained terrain, sparse vegetation, and underground burrows available for use throughout their entire life cycle (Klute et al. 2003). The birds most commonly live in burrows created by California ground squirrels. Burrowing owls feed opportunistically on arthropods, small mammals, birds, amphibians, and reptiles.

The CNDDB contains no records of burrowing owls in Morgan Hill over the past decade (CNDDB 2015). Historical sightings of burrowing owls in Morgan Hill include an observation of an owl using an artificial burrow at El Toro Elementary School in March 2003. Owls were previously observed on this same site in 1998, 2000, and 2001. Indirect evidence of burrowing owls (e.g., whitewash, feathers, and pellets) was observed approximately 0.4 miles northeast of near the intersection of Edmundson and Sunnyside Avenues in August 2002. No burrowing owls have been observed on that site since.

The site does not occur within modeled occupied habitat as shown on Figure 5-11 of the SCVHP, nor does it occur within the SCVHP-defined Burrowing Owl Survey and Fee Zone.

A few ground squirrel burrows were observed in the northwest corner of the property adjacent to E. Dunne Avenue. No burrowing owls or evidence of burrowing owl occupancy (e.g. whitewash, feathers, or pellets) were observed, and their location in an area of tall dense vegetation makes it highly unlikely that burrowing owls would use these burrows. Nevertheless, suitable burrows are present within the Project site.

Burrowing owl may forage in the open field west of the project site and has a very low potential to occupy the small mammal burrows in the northwest corner of the site adjacent to E. Dunne Avenue. Development of the site has the potential to affect individuals if present, and result in a small loss of underground habitat.

Project construction should conform to the requirements described in the Citywide Burrowing Owl Habitat Mitigation Plan (Plan) for the City of Morgan Hill (2003). Requirements include, but are not limited to, a pre-construction survey by a qualified biologist to determine the presence or absence of burrowing owl habitat within the Project site. The pre-construction survey must be conducted within 30 days of ground disturbance within any potential owl habitat. If burrows are observed, a qualified biologist must conduct four surveys on different dates to census the owl population on-site. Locations of active burrows would be mapped, and burrowing owls inhabiting these burrows should be evicted within seven days of ground disturbance according to protocol described in the Plan. Eviction shall only take place during the non-breeding season (September I through January 31), and a written report of survey and eviction results would be submitted to the Department of Planning. If no burrows are observed on-site, or if owls are absent during all four census surveys, a written report describing survey results shall be submitted to the City Of Morgan Hill Department of Planning, and ground-breaking activities may commence no more than 30 days after the completion of Burrowing Owl surveys.

Pallid Bat and Yuma Myotis: Pallid bat (California Species of Special Concern) is found in grasslands, chaparral, woodlands, and forests of California. It is most common in open, dry habitats with rocky areas for roosting. Day and night roosts include crevices in rocky outcrops and cliffs, caves, mines, trees (e.g., basal hollows of coast redwoods and giant sequoias, bole cavities of oaks, exfoliating Ponderosa pine and valley oak bark, deciduous trees in riparian areas, and fruit trees in orchards), and various human structures such as bridges (especially wooden and concrete girder designs), barns, porches, bat boxes, and human-occupied as well as vacant buildings. They forage over open shrub-steppe grasslands, oak savannah grasslands, open Ponderosa pine forests, talus slopes, gravel roads, lava flows, fruit orchards, and vineyards. Roosts must protect bats from high temperatures. Pallid bats are very sensitive to disturbance of roosting sites.

Yuma myotis (Western Bat Working Group Low Priority) occurs in a variety of low elevation habitats including riparian, arid scrublands and deserts, and forests. Day roosts are found in buildings, trees, mines, caves, bridges and rock crevices. Night roots are usually associated with buildings, bridges or other man-made structures (Philpott 1996).

Although none of the pallid bat or Yuma myotis occurrences in the CNDDB from the nine-quad area surrounding the project are in Morgan Hill, both bats are known from the region (CDFW 2015). The

outbuildings on site may provide suitable roosting habitat for pallid bats and Yuma myotis. A cursory inspection of the garage/workshed and barn revealed no evidence of guano, but the two-story shed next to the old farmhouse was not inspected due to concerns about safe access.

Pallid bat and Yuma myotis have potential to occur within the project site. The outbuildings within the Project site as well as some of the larger trees may be inhabited by these bats during the breeding and hibernation seasons (November through mid-August). Removal of occupied trees and structures may impact one or both of these species.

Pre-construction surveys for nesting birds shall be conducted by a qualified biologist not more than two weeks prior to site disturbance during the breeding season (February 1 through August 31). If site disturbance commences outside the nesting season, pre-construction surveys for nesting birds are not required. If active nests of raptors and other migratory birds are not detected within approximately 250 feet of the project site, no further mitigation is required. If nesting raptors or other migratory birds are detected on or adjacent to the site during the survey, a suitable construction-free buffer should be established around all active nests. The dimensions of the buffer (up to 250 feet) should be determined at that time and may vary depending on location and species. The buffer areas should be enclosed with temporary fencing, and construction equipment and workers should not enter the enclosed setback areas. Buffers should remain in place for the duration of the breeding season or until it has been confirmed by a qualified biologist that all chicks have fledged and are independent of their parents.

Nesting Raptors and Other Migratory Birds: Trees and structures on the project site provide suitable nesting habitat for nesting raptors such as red-tailed hawk and other avian species. Removal of trees, shrubs and the outbuildings has potential to cause the failure or abandonment of active nests.

As a Standard Condition of Approval, pre-construction surveys for nesting birds shall be conducted by a qualified biologist not more than two weeks prior to site disturbance during the breeding season (February 1 through August 31). If site disturbance commences outside the nesting season, pre-construction surveys for nesting birds are not required. If active nests of raptors and other migratory birds are not detected within approximately 250 feet of the project site, no further mitigation is required. If nesting raptors or other migratory birds are detected on or adjacent to the site during the survey, a suitable construction-free buffer should be established around all active nests. The dimensions of the buffer (up to 250 feet) should be determined at that time and may vary depending on location and species. The buffer areas should be enclosed with temporary fencing, and construction equipment and workers should not enter the enclosed setback areas. Buffers should remain in place for the duration of the breeding season or until it has been confirmed by a qualified biologist that all chicks have fledged and are independent of their parents.

4e. Tree and Biological Protection Ordinances

The City of Morgan Hill recognizes the importance of trees to the community and has established policies and guidelines for the preservation of native plants in the City's Open Space and Conservation Element of the General Plan. Specifically, Goal 6 and Policy 6c of the Element state:

- Goal 6. Protection of native plants and animals
- 6c. Preserve outstanding natural features, such as the skyline of a prominent hill, rock outcroppings, and native and/or historically significant trees.

These guidelines are implemented through Chapter 12.32 of the City Municipal Code, Restrictions on Removal of Significant Trees. Section 12.32.020 of the Code defines the type of plant that qualifies as a "tree" and the legal protection afforded to such resources. The section establishes the following definition:

12.32.020 - Definitions. G. "Tree" means any live woody plant rising above the ground with a single stem or trunk of a circumference of forty inches or more for nonindigenous species and eighteen inches or more for indigenous species measured at four and one-half feet vertically above the ground or immediately below the lowest branch, whichever is lower, and having the inherent capacity of naturally producing one main axis continuing to grow more vigorously than the lateral axes. All commercial tree farms, nonindigenous tree species in residential zones and orchards (including individual fruit trees) are exempted from the definition of tree for the purpose of this chapter. Trees of any size within the public right-of-way shall constitute a tree for the purposes of this subsection.

Based upon this definition, 23 of the 44 trees surveyed on the project site would qualify for protection under Chapter 12.32 of the City's Municipal Code and a permit would be required for the removal of these trees.

4f. Habitat Conservation Plans

The Santa Clara Valley Habitat Plan (SCVHP) was implemented in 2013. Six local partners (the County of Santa Clara, Santa Clara Valley Transportation Authority; Santa Clara Valley Water District, and the Cities of San Jose, Gilroy, and Morgan Hill) and two wildlife agencies (the California Department of Fish and Wildlife and the U.S. Fish and Wildlife Service) prepared and adopted this multispecies habitat conservation plan, which primarily covers southern Santa Clara County, as well as the City of San Jose with the exception of the bayland areas. The SCVHP addresses conservation of listed species and species that are likely to become listed during the plan's 50-year permit term. The eighteen covered species include nine plants and nine animals, including the western burrowing owl and the California tiger salamander. In general, the SCVHP is a fee based program aimed at providing for the regional conservation of these species.

The project site is within the SCVHP permit area, and urban development is a "Covered Activity" under the plan. Land cover in the Project site is classified as Urban – Suburban. No SCVHP land cover fees apply to the Project given its location in a "No Land Cover Fee" zone.

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Issues (and Supporting Information Sources)	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact	
5. Cultural Resources - Would the project:					
a) Cause a substantial adverse change in the significance of a historical resource as defined in 15064.5?				\boxtimes	
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to 15064.5?					
c) Directly or indirectly destroy a unique paleontological resour or site or unique geologic feature?	се				
d) Disturb any human remains, including those interred outside formal cemeteries?	of \square			\boxtimes	

5a. Historical Resources

The majority of the project site (98%) is currently an inactive walnut orchard. The parcel comprising the site also includes two residential structures and associated outbuildings. It is unclear when two of the residences were built; aerial photos of the project site indicate that the older residence was developed on this parcel ca. 1900. The second residence was built in the early 1960's. The proposed project would preserve the two residences on the site, remove the remnant walnut orchard and various landscape trees,

and subdivide the property to accommodate the development of 12 single-family homes and addition to the two existing homes on the site.

In 2006, the City of Morgan Hill compiled a comprehensive overview of the community's history to provide historic context and an assessment of potentially historic resources in the city. Historic context statements are important tools for the preservation planning process. The Historic Context Statement is meant to provide the City of Morgan Hill with a means to evaluate potential resources for their associative, architectural, or historic value. Such a tool provides the city with a baseline reference for updating its local historic preservation ordinance and conducting a survey to inventory historic properties within the City boundaries as well as for developing future preservation initiatives and incentives.

The 2006 Historic Context Statement includes an inventory of historic resources in the city as well as a historic timeline for development community. Appendix B of the Statement provides a list of Morgan Hill's historic properties; none of the project site's residences are included on the City's list of historic properties.

The residences on the project site appear to be over 50 years old and could be potentially have historic significance for the community. In order to ascertain whether these structures could be considered significant historic resources, the architectural historians of Carey & Co., Inc. (C&C) prepared a Historic Resource Evaluation⁷ for the two residences and outbuildings on the project site. The historians conducted a site visit on October 2, 2015 to evaluate the existing conditions, historic features, and architectural significance of the property. Additional research was completed including consultation of block books, Clerk-Recorder's documents, building permits, Sanborn Fire Insurance maps, the Morgan Hill Historical Society, Morgan Hill Library, the San Jose Public Library California Room, and San Jose City Directories. The assessment process and a detailed discussion of the buildings on the project site are included in the C&C report. The evaluation extends to the historic context of the site, history of the property, architect and builder, owner/occupant information, application of state significance criteria, and evaluation of building and site integrity.

The C&C report concludes that the buildings at 1390 East Dunne Avenue do not appear eligible for individual listing in the California Register of Historical Resources (CRHR) as they do not meet CRHR Criteria 1, 2, 3, or 4. Built circa 1900, the earlier Craftsman-style dwelling and its outbuildings were part of the agricultural past of Morgan Hill, but not in an individually significant way. The Ranch-style dwelling from the late1950s/early 1960s was not associated with any historic events. No individuals of particular significance are associated with the buildings. The dwellings were constructed in Craftsman and Ranch styles; however, neither dwellings nor their outbuildings are distinguished examples of their styles or architecturally significant in any other respect. There is no indication that the property has the potential to yield information important to the prehistory or history of the local area, California, or the nation. Nevertheless, the project applicant proposes to retain the two existing residences and therefore, project implementation would have no impact on these two structures.

5b, 5d. Archaeological Resources and Human Remains

An archaeological literature review for the project site was performed by Holman & Associates in November 2015. The results of the literature review indicated that there are no recorded historic or prehistoric resources on the project site and the parcel is considered to have a low to moderate potential

JANUARY 2016

⁶ City of Morgan Hill, 2006. Historic Context Statement for the City of Morgan Hill. October.

Oarey & Co., Inc., 2015. Historical Resource Evaluation: 1390 East Dunne Avenue, Morgan Hill, California. November 6. A full copy of this report is on file and available for review at the Morgan Hill Planning Department located at 17555 Peak Avenue.

for the discovery of prehistoric archaeological resources. There are no recorded prehistoric sites within 0.25 mile of the project site.

The proposed project would also be subject to the provisions of City of Morgan Hill Municipal Code Section 18.75.110. This section specifies that if a project is located within or adjacent to a known archaeological site, then a CEQA review of the project shall consider potentially significant impacts on archaeological resources and identify appropriate mitigation measures to be imposed as conditions of approval in addition to the standard conditions identified in subsection B of Section 18.75.110. Subsection B stipulates that if the project is not located within or adjacent to a known archaeological site, then the project applicant has the option to complete an archaeological survey of the property to determine the appropriate mitigation to be used as conditions of project approval or comply with the standard conditions of approval which shall be conclusively deemed to reduce potentially significant impacts to less than significant levels.

The City will require monitoring of ground-disturbing activities for archaeological resources and the reporting of appropriate treatment and disposition of such resources that may be uncovered. In the event that undocumented human remains or unknown significant historic or archaeological resources are discovered, subsection B.2. of Section 18.75.110 provides a specific protocol for the treatment of the uncovered human remains and/or resources. The protocol entails the process of identifying the human remains and the contact of appropriate parties such as the Native American Heritage Commission and the Amah Mutsun Tribal Band to determine Most Likely Descendant for further consultation on the disposition of the remains. As noted in the City's ordinance, the completion of the standard conditions of approval would reduce potentially significant impacts on archaeological resources to a less than significant level.

5c. Paleontological Resources

Paleontological resources are the fossilized remains of plants and animals, including vertebrates (animals with backbones), invertebrates (e.g., starfish, clams, ammonites, and marine coral), and fossils of microscopic plants and animals (microfossils). The age and abundance of fossils depend on the location, topographic setting, and particular geologic formation in which they are found. Fossil discoveries not only provide a historic record of past plant and animal life, but may assist geologists in dating rock formations. A review of records maintained by the University of California Museum of Paleontology in Berkeley indicates that the closest paleontological resources recorded in Santa Clara County occur approximately six miles north of Morgan Hill. These resources were discovered in geologic strata dating from the Pleistocene epoch of the Quaternary Period (2.6 million to 11,700 years ago).

Geologic mapping for the proposed project indicates the site is underlain by Pleistocene alluvial fan deposits. These deposits are similar in age to those containing the recorded paleontological resources; however, the site of the discovered paleontological specimen was in the hills north of Morgan Hill. While the potential for encountering paleontological resources at the project site is considered to be low due to the distance to the closest resource, there remains the potential to unearth unknown paleontological resources at the project site. In the event that such resources are uncovered, the standard conditions of approval for the mitigation of archaeological resource discovery will be applied to paleontological resources. Consequently, the project impacts on paleontological resources would be less than significant.

	Potentially Significant	Less than Significant Impact With Mitigation	Less Than Significant	No
Issues (and Supporting Information Sources)	Impact	Incorporated	Impact	Impact
6. Geology and Soils - Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.			\boxtimes	
ii) Strong seismic ground shaking?			\boxtimes	
iii) Seismic-related ground failure, including liquefaction?			\boxtimes	
iv) Landslides?			\boxtimes	
b) Result in substantial soil erosion or the loss of topsoil?			\boxtimes	
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?				
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?				\boxtimes

The evaluation of site geological and soils conditions and the effects of these conditions on the proposed project as well as the impacts of local geological and soils conditions on project facilities is based upon regional and local studies of the geological and soils conditions in the project vicinity and for the subject property. Reports⁸ providing geotechnical information for the project area and the site include Phase I and Phase II environmental site assessment and a geotechnical analysis for an adjoining site.

The materials underlying the site are mapped as Late Pleistocene alluvium (Qpa) by Helley and Lajoie (1979), which consist of weakly consolidated, slightly weathered, poorly sorted, irregular interbedded clay, silt, sand and gravel units. The Late Pleistocene alluvium has a maximum thickness of 150 feet and ranges in age from 35,000 to 70,000 years old, which was deposited from flowing water in stream channels, on stream terraces, and on alluvial fans. The active trace of the Calaveras Fault is situated

⁸ GeoSolve, Inc., 2015. Phase I and Phase II Environmental Site Assessments on Proposed Dunne Murphy Development – 3.41 Acres, 1390 East Dunne Avenue, Morgan Hill, California, 95037. April 13.

Pacific Geotechnical Engineering, 2002. Geotechnical Investigation for East Dunne Commercial Building, East Dunne and Murphy Avenues, Morgan Hill, California. October 7.

⁹ Diblee, T.W. and Minch, J.A., 2005. *Geologic Map of the Mt. Madonna Quadrangle, Santa Clara and Santa Cruz Counties, California. Dibblee Foundation Map DF-168.* Available online at http://ngmdb.usgs.gov/Prodesc/proddesc_73806.htm

approximately 3 miles east of the subject site, is considered active according to the Alquist-Priolo Earthquake Fault Zones Act (1997), and is a strike-slip fault with right-lateral motion.

The soil type mapped on the project site is Arbuckle gravelly loam. This is an alluvial soil formed from conglomerate, metasedimentary, and sedimentary rocks. The soil is deep and well-drained to moderately well-drained.¹⁰

6a. Seismic Hazards and Landslides

Fault Rupture. The project site is not located within an Alquist-Priolo Earthquake Fault Zone¹¹ and based on mapping of geologic hazards by Santa Clara County, the proposed project site is not crossed by any active fault zones and the closest fault rupture hazard zone is approximately 4.25 miles to the north.¹² Therefore, impacts related to the potential for fault rupture would be less than significant.

Groundshaking. Ground shaking is the cause of most damage during earthquakes and an earthquake of moderate to high magnitude generated within the San Francisco Bay Region could cause considerable ground shaking at the site, similar to that which has occurred in the past. The three faults that would most likely produce strong groundshaking at the project site include the San Andreas Fault located about 11 miles to the southwest, the Calaveras Fault located approximately 4 miles to the northeast, and the Sargent Fault located approximately 6 miles to the southwest. ¹³

The Association of Bay Area Governments has estimated the degree of groundshaking that could occur in the San Francisco Bay area on a regional basis and estimates that the project area would experience strong ground shaking in the event of an earthquake on one of the regional faults.¹⁴ To resist seismic forces, the proposed residences would need to be constructed using the appropriate seismic design criteria specified in the California Building Code (CBC). The criteria are determined on the basis of soil type, the magnitude of the controlling seismic event, slip rate of the nearest fault, and distance to the nearest active fault. The structural design for the proposed homes will be based on Chapter 16 of the 2013 CBC.

Seismic design provisions of current building codes generally prescribe minimum lateral forces, applied statically to the structure, combined with the gravity forces of dead and live loads. Therefore, structures designed in accordance with the CBC should be able to: (1) resist minor earthquakes without damage, (2) resist moderate earthquakes without structural damage but with some nonstructural damage, and (3) resist major earthquakes without collapse but with some structural as well as nonstructural damage. While conformance to the current building code recommendations does not constitute any kind of guarantee that significant structural damage would not occur in the event of a maximum magnitude earthquake, it is reasonable to expect that a well-designed and well-constructed structure would not collapse or cause loss of life in a major earthquake.

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Mosaic Associates, LLC, 2015. Biological Resources Report for the Busk Property, 1390 E. Dunne Avenue, Morgan Hill, CA. October.

¹¹ California Division of Mines and Geology, 1982. State of California Special Studies Zones, Morgan Hill, Revised Official Map. January 1. Available online at http://gmw.consrv.ca.gov/shmp/download/quad/MORGAN_HILL/ maps/MORGANHILL.PDF

¹² The County of Santa Clara, 2012. Santa Clara County Geologic Hazard Zones, Map 53. October 26. Accessed at https://www.sccgov.org/sites/dpd/DocsForms/Documents/GEO_GeohazardATLAS.pdf on November 13, 2015.

¹³ U.S. Geological Survey and California Geological Survey, 2006. *Quaternary Fault and Fold Database for the United States*. Accessed at http://earthquake.usgs.gov/hazards/qfaults/map/ on November 13, 2015.

¹⁴Association of Bay Area Governments, 2013. Earthquake and Hazards Program, Santa Clara County Earthquake Hazard. Accessed at http://quake.abag.ca.gov/earthquakes/santaclara/ on November 13, 2015.

As a Standard Condition of Approval, the applicant will be required to prepare a soils (geotechnical) engineering report and this report will specify structural design criteria for project improvements. As part of its review, the City of Morgan Hill Community Development Agency Building Division will review the planned design to confirm compliance with the CBC. Because compliance with the CBC, subject to approval as part of the building permit review process, should ensure that the buildings constructed under the proposed project do not collapse or cause loss of life in a major earthquake, impacts related to groundshaking would be less than significant.

Liquefaction. Liquefaction is a phenomenon in which saturated cohesionless soils are subject to a temporary, but essentially total, loss of shear strength because of pore pressure build-up under the reversing cyclic shear stresses associated with earthquakes. The project site is not located within a Santa Clara County Liquefaction Hazard Zone. Therefore, impacts related to liquefaction and related phenomena would be less than significant.

Landslides. The project site is not located within a Santa Clara County Landslide Hazard Zone. ¹⁶ Therefore, impacts related to landslides, including seismically induced landslides, would be less than significant.

6b. Erosion Hazards

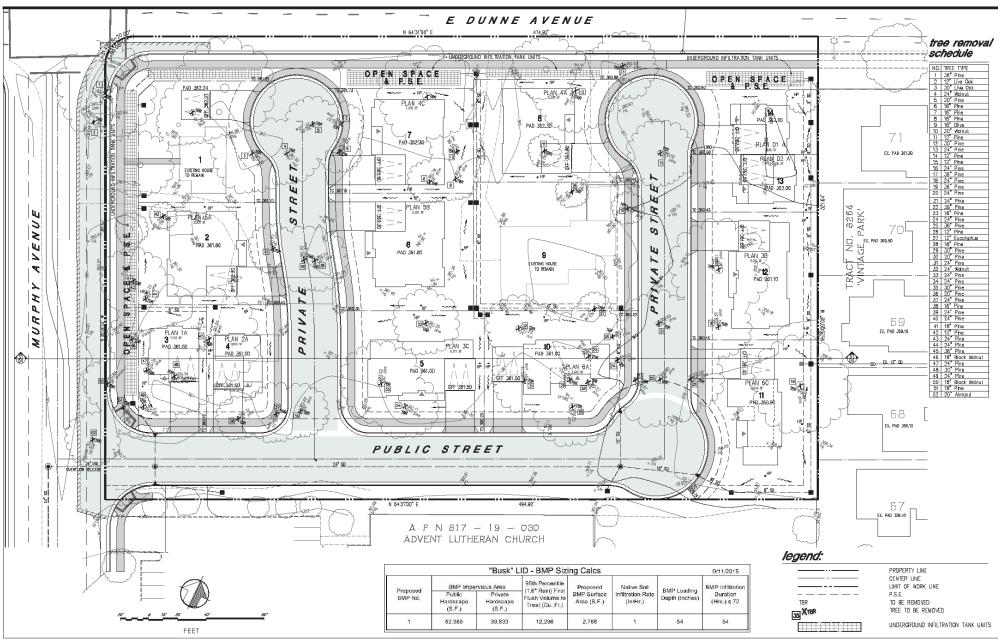
Without proper soil stabilization controls, such grading activities could increase the potential for soil loss and erosion by wind and stormwater runoff through the removal of stabilizing vegetation and exposure of areas of loose soil. The potential for soil erosion would exist during the construction period when the existing vegetative cover is removed and before new vegetation is established or hardscape is installed. As a Standard Condition of Approval, the project applicant would be required to implement an erosion control plan. The proposed erosion control measures would include use of fiber rolls or silt fences along the perimeter of all proposed private drives, installation of a sediment barrier at the site's principal storm drain inlet, provision of gravel bag check dams on the proposed public street, and hydroseeding of designated areas. The Preliminary Grading and Drainage Plan for the proposed project is shown in **Figure 8.**

In addition, as discussed in Section 9, *Hydrology and Water Quality*, in accordance with Chapter 13.30 of the City of Morgan Hill Municipal Code (Urban Storm Water Quality Management and Discharge Control), the project applicant would be required to comply with the requirements of the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ (Construction General Stormwater Permit) to control erosion during construction. In accordance with this permit, the project sponsor would be required to submit a Notice of Intent and implement a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the Construction General Stormwater Permit. The SWPPP would specify the use of best management practices to restrict soil erosion and the project applicant would also implement erosion and sedimentation controls in accordance with Chapter 13.30 of the municipal code.

With implementation of the City's Standard Conditions of Approval to require an erosion control plan in addition to drainage improvements required as part of the SWPPP, potential erosion hazards during construction would be reduced to a less-than-significant level.

¹⁵ The County of Santa Clara, 2012. Santa Clara County Geologic Hazard Zones, Map 53. October 26. Accessed at https://www.sccgov.org/sites/dpd/DocsForms/Documents/GEO_GeohazardATLAS.pdf on November 13, 2015.

¹⁶ The County of Santa Clara, 2012. Santa Clara County Geologic Hazard Zones, Map 53. October 26. Accessed at https://www.sccgov.org/sites/dpd/DocsForms/Documents/GEO_GeohazardATLAS.pdf on November 13, 2015.





6c, 6d, 6e. Geologic Stability and Soil Engineering Constraints

As a Standard Condition of Approval, the applicant will be required to prepare a geotechnical engineering report and this report shall include soil classifications and foundation design recommendations in conformance with UBC Chapter 29 (UBC Appendix Chapter 33).

Unstable Geologic Units or Soil. The project site is not located within a Santa Clara County Compressible Soil or Landslide Hazard Zone¹⁷ indicating that neither of these potential hazards would affect the project site. Further, the project would not include construction of basements or other subsurface structures that would involve substantial excavations that could become unstable. Therefore, this impact would be less than significant.

Expansive Soils. Expansive soil conditions could damage project improvements, which would represent a significant impact unless substantial damage is avoided by incorporating appropriate engineering into the grading and foundation design of proposed buildings and improvements.

Soils Incapable of Supporting Septic Tanks or Alternative Wastewater Disposal Systems. The project site is located within the Morgan Hill city limits and the area is served by the community's sewer system. No septic tanks or alternative wastewater disposal systems would be required for the project or proposed as part of the project. Rather, connection to the sewer system would eliminate the use of septic systems currently at the site. Therefore, there would be no impact related to having soils capable of supporting the use of septic tanks or alternative waste disposal systems.

Less than

Issues (and Supporting Information Sources)	Potentially Significant Impact	Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact	
7. Greenhouse Gases - Would the project:					
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment, based on any applicable threshold of significance?			\boxtimes		
b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?			\boxtimes		

"Greenhouse gases" (so called because of their role in trapping heat near the surface of the earth) emitted by human activity are implicated in global climate change, commonly referred to as "global warming." These greenhouse gases contribute to an increase in the temperature of the earth's atmosphere by transparency to short wavelength visible sunlight, but near opacity to outgoing terrestrial long wavelength heat radiation. The principal greenhouse gases (GHGs) are carbon dioxide, methane, nitrous oxide, ozone, and water vapor. Fossil fuel consumption in the transportation sector (on-road motor vehicles, off-highway mobile sources, and aircraft) is the single largest source of GHG emissions, accounting for approximately half of GHG emissions globally. Industrial and commercial sources are the second largest contributors of GHG emissions with about one-fourth of total emissions.

¹⁷ The County of Santa Clara, 2012. Santa Clara County Geologic Hazard Zones. October 26. Accessed at http://www.sccgov.org/sites/planning/GIS/GeoHazardZones/Documents/GeohazardMapsATLAS2.pdf65tg on November 13, 2015.

Significance Thresholds and Criteria. Exercising its own discretion as lead agency and similar to other San Francisco Bay Area jurisdictions, City staff has decided to rely on the thresholds within the *Options and Justification Report* (dated October 2009) prepared by the BAAQMD.¹⁸ The BAAQMD *Options and Justification Report* establishes thresholds based on substantial evidence and are consistent with the thresholds outlined within the BAAQMD's 2011 CEQA Air Quality Guidelines.¹⁹ Although BAAQMD failed to comply with CEQA before adopting its CEQA Guidelines, City staff believes that these recommendations still represent the best available science on the subject of what constitutes significant GHG effects on climate change and they are as follows:

- Compliance with a Qualified Climate Action Plan or
- Meet one of the following thresholds:
 - 1,100 MT CO₂e per year; or
 - 6.7 MT CO₂e per capita per year (residential) / 4.6 MT CO₂e per service population per year (mixed use)

For purposes of this report, project compliance with the 1,100 MT CO₂e/year threshold is used as the primary basis to determine significance.

7a. Greenhouse Gas (GHG) Emissions

Short-term GHG emissions would be generated by project-related construction activities. In addition, project implementation would also contribute to long-term increases in greenhouse gases (GHGs) from direct sources (traffic increases and minor secondary fuel combustion emissions from space heating). Development occurring as a result of the proposed project would also result in other indirect operational increases in GHG emissions as a result of electricity generation to meet project-related increases in energy demand. Electricity generation in California is mainly from natural gas-fired power plants. However, since California imports about 20 to 25 percent of its total electricity (mainly from the northwestern and southwestern states), GHG emissions associated with electricity generation could also occur outside of California. Space or water heating, water delivery, wastewater processing and solid waste disposal also generate GHG emissions.

The CalEEMod 2011.1.1 computer model was used to calculate GHG emissions that would be generated by the construction and operation of proposed residences, and results are presented in **Table 4**. As indicated in this table, project construction would generate up to approximately 329 metric tons of CO₂-equivalents (MT CO₂e) per year.²⁰ The BAAQMD does not have a quantitative significance threshold for construction-related GHG emissions, but the project's estimated construction-related GHG emissions are

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¹⁸ Bay Area Air Quality Management District, 2009. Revised Draft Options and Justification Report. October. Available online at http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Updated-CEQA-Guidelines.aspx.

¹⁹ Bay Area Air Quality Management District, 2011. CEQA Air Quality Guidelines. Updated May 2011 and May 2012. Available online at http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Updated-CEQA-Guidelines.aspx.

²⁰ Because of the differential heat absorption potential of various GHGs, GHG emissions are frequently measured in "carbon dioxide-equivalents" or CO₂e, which present a weighted average based on each gas's heat absorption (or "global warming") potential. When CO₂ and non-CO₂ GHG emissions are considered together, they are referenced as CO₂e, which add approximately 0.9 percent to CO₂ emissions from diesel equipment exhaust (California Climate Action Registry, *General Reporting Protocol, Version 3.1*, January 2009. Available online at: http://www.climateregistry.org/tools/protocols/general-reporting-protocol.html. Accessed on November 20, 2015). See Table 1 for other construction assumptions.

TABLE 4
PROJECT CONSTRUCTION-RELATED OPERATIONAL GHG EMISSIONS

GHG Source	Project MT CO ₂ e/year
Construction Emissions	
- Total (2016 and 2017)	328.5
Operational Emissions	
- Area	1.0
- Energy	47.5
- Mobile Sources	105.1
- Waste	6.5
- Water	2.7
Total	162.9
CEQA Significance Threshold	<1,100 MT CO ₂ e
SOURCE: CalEEMod Output (see Attachment	1)

expected to have a less-than-significant impact on global climate change. For comparison purposes, this emissions rate is well below this report's operational significance threshold of 1,100 metric tons (MT) of CO₂e per year, which would be an indication that the project's construction-related GHG emissions would be less than significant. The proposed project would also be subject to the existing CARB regulation (Title 13 of the California Code of Regulations, Section 2485), which limits idling of diesel-fueled commercial motor vehicles, and compliance with this regulation would further reduce GHG emissions associated with project construction vehicles (compliance with idling limits is required under Mitigation Measure AQ-1 in Section 3, Air Quality). The BAAQMD also encourages implementation of construction-related GHG reduction strategies where feasible, such as: using alternative-fueled (e.g., biodiesel, electric) construction vehicles/equipment such that these vehicles/equipment comprise at least 15 percent of the fleet; using local building materials such that these materials comprise at least 10 percent of all construction materials; and recycling or reusing at least 50 percent of construction waste or demolition materials. None of these measures is specifically proposed as part of the project.

Project operation is estimated to generate approximately 163 MT CO₂e per year. Such an increase would not exceed this report's significance threshold of 1,100 MT CO₂e per year. Therefore, the project's operational GHG emissions would be less than significant.

7b. Greenhouse Gas Reduction Plans, Policies, and Regulations

The City of Morgan Hill is currently preparing a Climate Action Plan, but does not currently have an adopted CAP. However, California has passed a number of bills related to GHG emissions and the Governor has signed at least three executive orders regarding greenhouse gases. The Governor's Office of Planning and Research has not yet established CEQA significance thresholds for GHG emissions. GHG statutes and executive orders (EO) include EO S-1-07, EO S-3-05, EO S-13-08, EO S-14-08, EO S-20-04, EO S-21-09, AB 32, AB 341, AB 1493, AB 3018, SB 97, SB375, SB 1078 and 107, SB 1368, and SB X12. AB 32 establishes regulatory, reporting, and market mechanisms to reduced statewide GHG emissions to 1990 levels by 2020. Pursuant to this requirement, the California Air Resources Board (CARB) adopted its Scoping Plan, which contains the main strategies to achieve required reductions by 2020. As indicated above, the project's construction-related and operational GHG emissions would not exceed this report's significance threshold of 1,100 MT. This threshold is based on the BAAQMD's 2011 CEQA Air Quality Guidelines, which in turn, relates to AB 32 GHG reduction goals. Therefore, the project's GHG emissions would not conflict with plans and policies adopted for the purpose of reducing GHG emissions, a less-than-significant impact.

Issues (and Supporting Information Sources)	Potentially Significant Impact	Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
8. Hazards and Hazardous Materials - Would the project:	_	-		
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?		\boxtimes		
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			\boxtimes	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?		\boxtimes		
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				\boxtimes
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				\boxtimes
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				\boxtimes

Less than

8a. Routine Transport, Use, or Disposal of Hazardous Materials

The development of additional residences at the project site would result in an increase in the generation of household hazardous wastes that are typical of any residential area. Common household hazardous wastes such as paint, pesticides, used oil and antifreeze, could result in direct or indirect effects on human health and the environment if not appropriately handled and disposed of. In addition to water quality impacts from stormwater runoff, other potential impacts such as direct human contact with hazardous materials could result from improper use or disposal of hazardous household chemicals.

Although Morgan Hill residents can legally dispose of household hazardous wastes under the County of Santa Clara Household Hazardous Waste program, the project's impacts related to the generation and disposal of hazardous waste would be potentially significant because not all residents are knowledgeable in the identification of hazardous wastes and appropriate disposal requirements. This impact would be reduced to less than significant with implementation of Mitigation Measure HAZ-1, Buyer Education Program for Household Hazardous Waste, which requires implementation of a buyer education program to educate residents about the identification of household hazardous wastes, environmental hazards associated with mishandling of the wastes, appropriate disposal methods, and how to make an appointment for disposal. Impacts related to the routine transport of household hazardous materials would

be less than significant because the materials are commercially packaged for retail sale, and transport of these materials is well regulated by state and federal regulations.

8b, 8d. Release of or Exposure to Hazardous Materials

Phase I and Phase II Environmental Site Assessments (ESA) was completed for the project site by GeoSolve, Inc. in April 2015.²¹ The ESA is available for public review at the City's Community Development Department, located at 17575 Peak Avenue. The following impact discussion summarizes the findings of the Phase I and II ESAs regarding past site uses, the use of hazardous materials at the project site, and the potential presence of soil and/or groundwater contamination. The ESA included a site reconnaissance and an interview with the property owner as well as review of regulatory databases, local agency files specific to the site, and historical documentation (including aerial photographs, topographic maps, and City Directories).²²

Site History and Description. A review of historical records and aerial photos of the project site indicates that the subject property was occupied by walnut orchards since 1939. An older residence was evident on site at that time and historical research performed for the Cultural Resources evaluation in Section 5 of this study estimates construction of the house circa 1900. In 1939, East Dunne Avenue and Murphy Avenue were unpaved roads serving the project area. In the 1950's, orchards covered the subject property, but were diminishing in the surrounding areas. By 1968, a second residence was built on the site and orchards were still on the property. In 1993, a residential development and church were noted to the east and south, respectively, of project site. No significant changes on the property were observed in aerial photos dated 1998 through 2012.

A field geologist visited the subject property in March 2015 and noted no evidence of any spills or releases on the property, nor was any evidence of storage, generation, or illegal disposal of hazardous materials observed. The Phase I ESA also indicated there was no evidence of underground or aboveground petroleum storage tanks, PCB-containing equipment, or pits/ponds/lagoons associated with waste treatment/disposal. The field survey identified a groundwater-supply well present on the site within an older water tower, along with two septic tanks near each of the residences. Potable water is supplied by the active groundwater well, which is approximately 120 feet bgs. Metal and wood debris was observed near the older garages, and oily-stained concrete floors were observed within the older garages, which were occupied with automobiles, paint cans, tools, and debris.

Due to the age of the residences on the subject property, site buildings were examined for the presence of lead-based paint (LBP). Visual observation of the site buildings indicated that LBP is present on the residences and historic water tower. In addition, asbestos-containing materials (ACMs) may be present on and within the structures. Since the trees were walnut trees, use of pesticides may have been performed, and organochloride and arsenic pesticide residues maybe within the surficial soil at the property.

The environmental database review of City, County, and State records did not identify any sites in the project vicinity that would likely affect soil or groundwater quality at the subject property.

Hazardous Materials in Soil. As described above, the proposed project site was in agricultural use from at least 1939 until 1968. Due to its past agricultural use, historic applications of pesticides could have occurred at the subject property, which could result in the presence of residual pesticides in the shallow

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²¹ GeoSolve, Inc., 2015. Phase I and Phase II Environmental Site Assessments on Proposed Dunne Murphy Development – 3.41 Acres, 1390 East Dunne Avenue, Morgan Hill, California, 95037. April 13.

²² Sanborn Fire Insurance Maps are standard historical sources also typically reviewed for Phase I Environmental Site Assessments. However, there is no Sanborn Map coverage for the proposed project site.

soils of the property. Pesticide residuals in the soil could present a health hazard to construction workers, the public, or future residents at the site if present at concentrations that would present a health risk. To determine whether pesticide residuals are still present in site soils, a Phase II Subsurface Investigation was conducted at the subject property on April 6, 2015.²³ The Phase II report is available for public review at the City's Community Development Department, located at 17575 Peak Avenue.

Six soil borings were collected at the site to total depths ranging from 0.5 to 3.0 feet using a hand auger tool. Select samples were preserved for laboratory analysis and tested for organo-chlorine pesticides, lead, and arsenic. Based on the laboratory analytical results obtained from the 6 soil samples analyzed, arsenic was detected above the Regional Water Quality Control Board - Region 2 (RWQCB) Environmental Screening Level (ESL) for residential development of 0.39 mg/Kg for arsenic (Table B, December 2013). Although arsenic was detected above the ESL for residential development of 0.39 mg/Kg, background concentrations are used as cleanup goals by the California EPA (CalEPA). Laboratory analytical results of arsenic background sample AS-1 indicated arsenic concentrations of 4.6 mg/Kg, which is within the same order of magnitude of arsenic concentrations of soil samples S-1 through S-5. Furthermore, in the Background Metal Concentrations in Soils within Northern Santa Clara County, California (Scott, 1991), the maximum concentration of arsenic detected was 20 mg/Kg.

Dieldrin was detected at 0.058 mg/Kg, which is slightly above the ESL of 0.030 mg/Kg and lead was detected at 300 mg/Kg, which is also above the residential ESL of 80 mg/Kg in soil sample S-5. No elevated concentrations of lead or organochloride pesticides were detected in soil samples S-1 through S-4. Soil sample S-5 was collected near the older residence and water tower, suggesting historical use of organochloride pesticides occurred at the subject site. Furthermore, the paint on the historic residence and water tower was lead-based and appears to be isolated the areas around the historical residence and water tower. However, soil sample S-5 was collected immediately adjacent to the proposed development. Based on the laboratory analytical results of soil samples S-1 through S-4, and AS-1, *GeoSolve, Inc.* recommends additional environmental work on the subject property is not warranted.

In order to ensure that construction workers and future residents of the proposed development are not exposed to potentially hazardous materials found on the site, Mitigation Measures HAZ-2 through HAZ-4 are included for implementation as part of the proposed project. The impacts of potentially hazardous materials on the site would be reduced to less than significant levels with the implementation of Mitigation Measures HAZ-2 through HAZ-4.

Naturally Occurring Asbestos. Naturally occurring asbestos can be released from serpentinite and ultramafic rocks when the rock is broken or crushed. At the point of release, the asbestos fibers may become airborne, causing air quality and human health hazards. Serpentinite and/or ultramafic rock are known to be present in 44 of California's 58 counties. However, the project site is not located in an area where naturally occurring asbestos is likely to be present²⁴ and therefore, there is no impact associated with exposure to naturally-occurring asbestos.

²³ GeoSolve, Inc., 2015. Phase I and Phase II Environmental Site Assessments on Proposed Dunne Murphy Development – 3.41 Acres, 1390 East Dunne Avenue, Morgan Hill, California, 95037. April 13..

²⁴ Department of Conservation Division of Mines and Geology, 2000. A General Location Guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos Report. August. Available online at ftp://ftp.consrv.ca.gov/pub/dmg/pubs/ofr/ofr 2000-019.pdf

8c. Hazardous Emissions or Use of Acutely Hazardous Materials

Hazardous emissions are toxic air contaminants (TACs) identified by the CARB and the BAAQMD. Extremely hazardous materials are defined by the State of California in Section 25532 (2)(g) of the Health and Safety Code. During project construction, only common hazardous materials such as paints, solvents, cements, adhesives, and petroleum products (such as asphalt, oil, and fuel) would be used, none of which are considered extremely hazardous materials. As discussed in Section 3, Air Quality, the only toxic air contaminant that would be emitted during construction is diesel particulate matter (DPM). The Nordstrom Elementary School is located across East Dunne Avenue from the subject property, less than ¼ mile from the site; no other schools are located within ¼ mile of the project site.

As discussed in Section 3d, Exposure of Sensitive Receptors, operation of project-related diesel construction equipment would result in less-than-significant cancer and non-cancer risks on sensitive receptors located adjacent to the site. Therefore, construction-related impacts on the Oakwood School, which is located within ¼-mile of the site (but farther from the site than the closest sensitive receptors), would also be less than significant.

There would be no use of extremely hazardous materials or emissions of TACs once project residences are constructed and occupied. Therefore, there is no impact associated with hazardous emissions within \(^14\)-mile of a school once the project is constructed.

8e, 8f. Airports/Airstrips

The nearest airport to the proposed project is the San Martin Airport, located approximately 3.6 miles to the south of the site. Therefore, there is no impact associated with safety hazards due to location of a project within 2 miles of a public airport or in the vicinity of a private airstrip.

8g. Emergency Plans

The project would not impair or physically interfere with an adopted emergency response or emergency evacuation plan. The project will be required to comply with Fire Department Standard Details and Specifications to ensure adequate emergency access to project buildings by fire engines. Therefore, the project's impact on emergency response would be less than significant.

8h. Wildland Fire Hazards

The proposed project site is not located in a fire hazard severity zone within a local responsibility area²⁵ or state responsibility area.²⁶ Therefore, there is no impact related to risks associated with wildland fires.

Mitigation Measures - Hazards and Hazardous Materials (HAZ)

In order to ensure that construction workers and future residents of the proposed development are not exposed to potentially hazardous materials found on the site, Mitigation Measures HAZ-1 through HAZ-4 are included for implementation as part of the proposed project.:

HAZ-1: Implement Buyer Education Program for Household Hazardous Waste: The project sponsor, working with the City of Morgan Hill and County of Santa Clara Household Hazardous Waste program, shall implement a Buyer Education Program for Household Hazardous Waste, developing materials to educate buyers about the identification of household hazardous wastes,

²⁵ California Department of Forestry and Fire Protection, *Santa Clara County Draft Fire Hazard Severity Zones in LRA*, October 4, 2007. Available online at http://www.fire.ca.gov/fire_prevention/fhsz_maps_santaclara.php.

²⁶ California Department of Forestry and Fire Protection, *Santa Clara County Fire Hazard Severity Zones in SRA*, Adopted by CAL FIRE on November 7, 2007. Available online at http://www.fire.ca.gov/fire_prevention/fhsz_maps_santaclara.php.

environmental hazards associated with mishandling of the wastes, appropriate disposal methods, and how to make an appointment for disposal. At a minimum, the educational materials shall include a list of example household hazardous wastes, discuss the environmental impacts of improper disposal, explain how to make an appointment for disposal, and list safer and less toxic alternatives to hazardous products commonly used. The educational materials shall be provided to the buyer at the time of purchase.

- HAZ-2: Removal and Disposal of Existing Hazardous Materials. Removal and Disposal of Existing Hazardous Materials. Prior to demolition of the existing buildings at the project site, the project applicant shall retain a qualified and licensed contractor to remove all hazardous materials (pesticides, fungicides, other agricultural chemicals, sealants, lubricants, antifreeze, paints, and others) as well as all fuel tanks and 55- gallon drums from the property, and legally dispose of these materials. Documentation of appropriate disposal shall be submitted to the City of Morgan Hill Community Development Agency Building Division prior to issuance of a demolition permit.
- HAZ-3: Hazardous Building Materials Removal. Prior to demolition of the existing buildings at the project site, the project applicant shall require that the contractor(s) have a hazardous building materials survey completed by a Registered Environmental Assessor or a registered engineer. This survey shall be completed prior to any demolition activities associated with the project. If any friable asbestos-containing materials or lead-containing materials are identified, adequate abatement practices, such as containment and/or removal, shall be implemented in accordance with applicable laws prior to demolition. Specifically, asbestos abatement shall be conducted in accordance with Section 19827.5 of the California Health and Safety Code, as implemented by the BAAQMD, and 8 CCR Section 1529 and Sections 341.6 through 341.14, as implemented by Cal/OSHA. Lead-based paint abatement shall be conducted in accordance with Cal/OSHA's Lead in Construction Standard.

Any PCB-containing equipment, fluorescent light tubes containing mercury vapors, and fluorescent light ballasts containing DEHP shall also be removed and legally disposed of in accordance with applicable laws including 22 CCR Section 66261.24 for PCBs, 22 CCR Section 66273.8 for fluorescent lamp tubes, and 22 CCR Division 4.5, Chapter 11 for DEHP.

- HAZ-4: Soil Sampling and Management. The following measures shall be required to reduce public health risks related to exposure to hazardous materials to a less-than-significant level.

 Oversight agency review may amend these measures as applicable.
 - a. The project applicant shall retain a qualified professional to update the environmental database review performed as part of the Phase 1 Environmental Site Assessment no more than 90 days prior to the start of construction. The qualified professional shall prepare a report summarizing the results of the environmental database review and assessing the potential for any identified chemical release sites to affect soil quality at the proposed project site. Appropriate soil analysis to evaluate the potential for soil contamination at the proposed project site, if needed, shall also be identified.
 - b. The project applicant shall retain a qualified professional to conduct a soil quality investigation to assess the potential presence of pesticides and associated metals in the soil as well as the potential presence of any hazardous materials that may have been spilled. If the updated environmental database review performed in accordance with HAZ-4a, above, identifies the need for additional sampling, it shall be included in this investigation. The qualified professional shall prepare a report summarizing the results of the soil investigation, including recommendations for site cleanup and disposal of excavated soil.

- c. The project applicant shall participate in the Voluntary Cleanup Program (VCP) administered by the Santa Clara County Department of Environmental Health (County) to develop the appropriate plan of action based on the results of the soil quality investigation conducted under HAZ-4b, above. If additional investigation or remediation is needed, the project applicant shall implement such action with oversight from the County, unless referred to an alternate agency.
- d. The applicant shall submit a "no further action" letter from the oversight agency or comparable closure document that demonstrates the site has been released as clean or a mitigation plan has been approved and implemented. Each phase of building permit issuance shall be contingent upon approval of the soil investigation and remediation documentation.
- e. If the soil investigation identifies soil requiring off-site disposal that is not suitable for unrestricted disposal, the project applicant shall require the construction contractor(s) to prepare a Soil Management Plan (SMP). The SMP shall provide a plan for disposal of identified hazardous soils and excess soil produced during construction activities, including the disposal methods for soil, potential disposal sites, and requirements for written documentation that the disposal site will accept the excess soil. If appropriate, excess soil may be disposed of on-site, under foundations or in other locations in accordance with applicable hazardous waste classifications and disposal regulations.
 - The contractor shall be required to submit the SMP to the project applicant for acceptance prior to implementation. If necessary, excess soil from construction activities shall be sampled to determine the appropriate disposal requirements in accordance with applicable hazardous waste classification and disposal regulations prior to or during construction,. The project applicant shall also submit the SMP to the County of Santa Clara Department of Environmental Health a minimum of 30 days prior to the planned start of construction,
- f. If recommended by the qualified professional, the project applicant shall require the construction contractor to prepare and implement a site safety plan identifying the chemicals present, potential health and safety hazards, monitoring to be performed during site activities, soils-handling methods required to minimize the potential for exposure to harmful levels of the chemicals identified in the soil, appropriate personnel protective equipment, and emergency response procedures.
- g. The project applicant shall require the construction contractor(s) to have a contingency plan for sampling and analysis of potential hazardous materials and for coordination with the appropriate regulatory agencies, in the event that previously unidentified hazardous materials are encountered during construction. If any hazardous materials are identified, the contractor(s) shall be required to modify their health and safety plan to include the new data, conduct sampling to assess the chemicals present, and identify appropriate disposal methods. Evidence of potential contamination includes soil discoloration, suspicious odors, the presence of USTs, or the presence of buried building materials.

Less than

Issues (and Supporting Information Sources)	Potentially Significant	Significant Impact With Mitigation	Less Than Significant	No
Issues (and Supporting Information Sources) 9. Hydrology and Water Quality - Would the project:	Impact	Incorporated	Impact	Impact
a) Violate any water quality standards or waste discharge requirements?				

In the second Constitution of the second constit	Potentially Significant	Less than Significant Impact With Mitigation	Less Than Significant	No
Issues (and Supporting Information Sources)	Impact	Incorporated	Impact	Impact
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?			\boxtimes	
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?				
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?				
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?			\boxtimes	
f) Otherwise substantially degrade water quality?		\boxtimes		
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				\boxtimes
h) Place within a 100-year flood hazard area structures, which would impede or redirect flood flows?				\boxtimes
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				
j) Inundation by seiche, tsunami, or mudflow?				

The 3.65-acre project site is very level, with elevations from approximately 359 to 361 feet above mean sea level. Under current conditions, rainfall percolates into soils on most of the site and contributes to groundwater recharge. Intense storm runoff drains from the project site and enters the municipal storm drain system in East Dunne Avenue and Murphy Avenue. Storm runoff in the municipal storm drain system flows south and west from the site, and is conveyed to the Madrone Channel, an engineered flood control channel adjoining the east side of SR 101, approximately 0.4 mile to the southwest. Madrone Channel runoff flows discharge to Llagas Creek approximately 5.25 miles to the south of the project site.²⁷

9a, 9f. Water Quality

Construction. The proposed project includes removal of the existing residences and ancillary structures at the site and construction of 12 new residences along with associated storm drainage improvements and

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²⁷ Sowers, Janet M. and Henkle, Jameson E., 2009. Creek and Watershed Map of Morgan Hill & Gilroy.

other infrastructure. Excavation, filling, and other earth moving activities would be conducted throughout the 3.65-acre site. Without proper precautions, this excavation and associated stockpiling of soil and placement of imported fills could induce erosion, and related sedimentation, resulting in degradation of water quality in the existing storm drain system. Construction activities would also require the use of hazardous materials that could degrade water quality without proper controls.

However, in accordance with Chapter 13.30 of the City of Morgan Hill Municipal Code (Urban Storm Water Quality Management and Discharge Control), the project applicant would be required to comply with the requirements of the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ (Construction General Stormwater Permit) to control erosion during construction. The Construction General Stormwater Permit applies to projects that disturb one or more acres of soil, or disturb less than one acre but are part of a larger common plan of development that disturbs one or more acres. Construction activity subject to this permit includes clearing, grading and disturbances to the ground such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. In accordance with this permit, the project sponsor would be required to submit a Notice of Intent and implement a Storm Water Pollution Prevention Plan (SWPPP).

The SWPPP prepared in accordance with this permit would include at least the minimum BMPs related to housekeeping (storage of construction materials (including hazardous materials), waste management, vehicle storage and maintenance, landscape materials, pollutant control); non-stormwater management; erosion control; sediment control; run-on and run-off control. Additional BMPs would be specified as needed to protect water quality from construction-related stormwater and non-stormwater discharges. As part of the SWPPP, the project applicant would implement a construction site monitoring program to demonstrate compliance with the discharge prohibitions of the General Permit; demonstrate whether non-visible pollutants are present and could contribute to an exceedance of water quality objectives; identify the need for correction actions, additional BMPs, or SWPPP revisions; and evaluate the effectiveness of the existing BMPs. The SWPPP must also be submitted to the City of Morgan Hill Engineering Division for review and approval. Chapter 13.30 of the municipal code also specifies requirements for implementation of erosion and sedimentation controls.

With implementation of the requirements of the Construction General Stormwater Permit and specific erosion and sedimentation requirements of Chapter 13.30 of the City of Morgan Hill Municipal Code, water quality impacts related to erosion and a release of hazardous materials during construction would be less than significant.

Post-Construction. Most of the 3.65-acre project site is open space containing remnant orchards and ruderal vegetation, and most of the stormwater infiltrates to the groundwater through the soil. Under the proposed project, the total building coverage for all 12 residences would be approximately 0.71 acre, and an additional 1.6 acres of impervious surfaces would be created by the construction of driveways, sidewalks, and streets. In all, impervious surfaces would comprise 2.08 acres, or approximately 57 percent of the post-development project site. This increase in impervious surfaces could decrease the amount of stormwater infiltration and increase flows to the storm sewer system, potentially increasing the discharge of stormwater pollutants to the runoff flows, and ultimately Llagas Creek.

In order to limit stormwater pollution, post-construction stormwater runoff from the proposed project would be managed in accordance with Resolution R3-2013-0032 issued by the California Regional Water Quality Control Board, Central Coast Region.²⁸ This resolution formally adopts post-construction

Resolution No. R3-2013-0032 is available online at http://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/docs/lid/lid_hydromod_charette_index.shtml

stormwater management requirements for development projects in the Central Coast Region. The requirements identify 10 Watershed Management Zones (WMZs) in the covered area, and specify stormwater management requirements for each zone, depending on the size of the development project. Because the proposed project site is located in an area classified as WMZ-1, and would involve the creation of 92,221 s.f. of impervious surfaces, stormwater management at the project site must include site design and runoff features to limit the amount of runoff from the project site as well as on-site water quality treatment to reduce pollutant loads in the stormwater runoff using a Low Impact Development (LID) treatment system such as biofiltration. In WMZ-1, the treatment system must retain 95 percent of the runoff from the project site and also maintain peak runoff flows such that they do not exceed preproject flows.

As described in the Project Description, the project applicant would construct underground infiltration tank units in open space areas along the northern and western periphery of the project site to treat at least 95 percent of the runoff from the project site. The design, construction, operation, and maintenance of the system would be addressed in a Stormwater Control Plan submitted to the City of Morgan Hill in accordance with the stormwater management requirements adopted by Resolution R3-2013-0032. This plan would demonstrate how the bioretention facility would meet the specified water quality, runoff retention, and peak flow management requirements. Prior to occupancy of the project, the stormwater controls would be field verified by the City of Morgan Hill to confirm design of the controls in accordance with the specified standards, and the controls would be subject to later operation and maintenance inspections by the City.

With implementation of the requirements adopted by Resolution R3-2013-0032 as a Standard Condition of Approval, water quality impacts related to violation of water quality standards or waste discharge requirements would be less than significant once the project is constructed.

Existing Well. As discussed in Section 3.8, Hazards and Hazardous Materials (Impact 3.8b, d), there is a 126-foot deep groundwater-supply well present on the site within an older water tower, near one of the residences. If it is not properly abandoned prior to construction, damage to the well could provide a downward conduit for groundwater contamination during construction and once the residences are constructed. The damaged well could also provide a conduit for cross contamination between aquifers. This is a potentially significant water quality impact. Mitigation Measure HYD-1 requires abandoning the well in accordance with applicable City and County well abandonment regulations and would reduce this impact to a less-than-significant level.

9b. Groundwater Resources

The proposed project is located in the Llagas Subbasin of the Gilroy-Hollister Groundwater Basin which has an area of 87 square miles and is used by the City of Morgan Hill as a water supply.^{29,30} However, the project would not result in depletion of groundwater supplies in this subbasin because the project does not propose to install wells or otherwise use groundwater beyond what is supplied by the City. Further, in accordance with current building standards, development of residential uses on the site would include the use of water-conserving fixtures that would help minimize water use by future residents.

²⁹ City of Morgan Hill, 2013. Morgan Hill 2035, Existing Conditions White Papers, Environmental Resources and Hazards. Public Review Draft. May 16. Available at http://morganhill2035.org/wp-content/uploads/2013/06/4 EnvResourcesHazards.pdf

³⁰ California Department of Water Resources, 2004. California's Groundwater Bulletin 118, Central Coast Hydrologic Region, Gilroy-Hollister Groundwater Basin, Llagas Subbasin. February 27. Available at http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/3-3.01.pdf

The project includes the construction of 92,221 s.f. of new impervious surfaces which could reduce the infiltration of stormwater at the site, resulting in an associated decrease in groundwater recharge in the project area. However, the new impervious surfaces represent less than 0.01 percent of the total area of the groundwater subbasin. Further, as discussed in 9a, the project applicant would construct a bioretention facility to infiltrate 95 percent of the stormwater runoff from the project site in accordance with the stormwater management requirements adopted by Resolution R3-2013-0032. With construction of the proposed stormwater controls, the amount of stormwater recharged to the groundwater would be similar to existing conditions and any reduction in groundwater recharge would be minute.

Based on the above analysis, impacts related to depletion of groundwater resources and interference with groundwater recharge would be less than significant.

9c, 9d, 9e. Drainage

The project site does not include any existing streams or water course that could be altered or diverted and there are no surface impoundments, wetlands, natural catch basins, settling ponds, or lagoons on the site. Therefore, there would be no impact related to alteration of drainage patterns by altering the course of a stream in a manner that would cause erosion or flooding on or off-site.

The project includes the construction of 92,221 s.f. of new impervious surfaces which could potentially concentrate stormwater runoff flows and result in on- or off-site erosion or flooding, increase flows to the storm sewer system, and increase the discharge of stormwater pollutants to the storm sewer. However, as discussed in 9a, the project applicant would construct a bioretention facility that would treat and retain 95 percent of the runoff from the project site and also maintain peak runoff flows such that they do not exceed pre-project flows in accordance with the stormwater management requirements adopted by Resolution R3-2013-0032. With implementation of the required stormwater controls, the project would not result in runoff that would cause on- or off-site erosion or flooding, exceed the capacity of the existing storm sewer system, or provide an additional source of polluted runoff. Therefore, impacts related to these topics would be less than significant.

9g, 9h, 9i, 9j. Flood Hazards

100-Year Flood. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps, the project area is located well outside of the 100-year flood zone associated with the closest drainage channel, Madrone Channel.³¹ Also, the City of Morgan Hill has not identified a 100-year flood zone at the project site.³² The project site is located in Zone X on the Flood Insurance Rate Map by FEMA. Zone X identifies areas that have a 0.2% probability of flooding every year (also known as the "500-year floodplain"). Properties in Shaded Zone X are considered to be at moderate risk of flooding under the National Flood Insurance Program. Flood insurance is *not* required for properties in Zone X. Therefore, there would be no impact related to placement of housing in a 100-year flood hazard area or impedance or redirection of flood flows.

Inundation by Dam Failure. Dams located near Morgan Hill include Anderson Dam and Chesbro Dam. According to the Association of Bay Area Governments (ABAG), almost all of the valley floor terrain in

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³¹ Federal Emergency Management Agency (FEMA), 2009. Flood Insurance Rate Map, Santa Clara County, California and Unincorporated Areas, Panel 444 of 830. Map Number 06085C0444H. May 18.

³² City of Morgan Hill, 2012. City of Morgan Hill Flood Report. Accessed at http://www.morgan-hill.ca.gov/documentcenter/view/5788.

Morgan Hill is within the area that would be inundated if these dams were to fail with reservoirs at full capacity. The project site is located in the dam failure inundation area of Anderson Dam.³³

In July 2011, the Santa Clara Valley Water District completed a seismic stability evaluation of Anderson Dam. The evaluation found that the dam is subject to significant damage if a large earthquake were to occur close to the dam. A storage restriction of 25.5 feet below the spillway has been put in place to protect public safety. The dam's two regulatory agencies, the California Division of Safety of Dams and the Federal Energy Regulatory Commission approved the restriction. The restriction will allow the dam to fill to 67 percent of its full storage capacity. District staff believes that this will prevent the uncontrolled release of water after a major earthquake. The water district has initiated a capital project, the Anderson Dam Seismic Retrofit Project, to complete the planning, design and construction of a seismic retrofit by the end of 2018. The operating restriction will remain in place until the project is completed. The potential for flooding on the site is considered to be negligible to very low and, consequently, impacts related to flooding as a result of failure of a levee or dam would be less than significant.

Inundation by Seiche, Tsunami, or Mudflow. The project site is located at an elevation of approximately 359 to 361 feet above mean sea level, more than 19 miles inland from the Pacific Ocean coastline, and separated from the coast by mountainous terrain; therefore, there would be no risk associated with tsunamis which are large sea waves. Seiches are standing waves caused by large-scale, short-duration phenomena (e.g. wind or atmospheric variations or seismic activity) that result from the oscillation of confined bodies of water (such as reservoirs and lakes) that may damage low-lying adjacent areas as a result of changes in the surface water elevation. The project site is not located in the vicinity of any confined water bodies and would therefore not be subject to a seiche. Based on this, there would be no impact related to exposure of people or structures to significant risk of loss, injury, or death involving seiche, or tsunami. Risks associated with landslide-induced mudflows are discussed in Geology and Soils.

Mitigation Measure – Hydrology and Water Quality (HYD)

The following measure shall be implemented by the project applicant to reduce the project's hydrology and water quality impacts to a less-than-significant level:

HYD-1: Properly Abandon Existing Well. The project sponsor shall retain a licensed well driller to destruct or abandon the former irrigation well at the project site in accordance with the standards specified in Santa Clara Valley Water District Ordinance 90-1 and the California Water Well Standards developed by the California Department of Water Resources (http://www.water.ca.gov/groundwater/well_info_and_other/california_well_standards/well_standards_content.html). Documentation of appropriate disposal shall be submitted to the City of Morgan Hill Building Inspection Department prior to issuance of a demolition permit.

Issues (and Supporting Information Sources)	Potentially Significant Impact	Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
10. Land Use and Planning - Would the project:				
a) Physically divide an established community?				

³³ Association of Bay Area Governments, Dam Failure Inundation Hazard Map for Morgan Hill, 1995. Accessed at http://www.abag.ca.gov/cgi-bin/pickdamx.pl

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				\boxtimes

The Project Description presents a description of the land use designations and development application for the 3.65-acre project site. In brief, the project site (APN 817-19-044) has a General Plan designation (General Plan Land Use Diagram, 2012) for Single-Family Medium Density use of 3 to 5 dwelling units per acre. Zoning for the project site is R-1, 7,000 PD, similar to residential zoning and development surrounding the site. This level of proposed residential use would be consistent with the General Plan's Single-Family Medium density designation.

The project site is adjoins single-family residential development on its eastern perimeter. The proposed project could be considered an in-fill project, extending existing residential neighborhoods in the project area. Consequently, the proposed project would not divide an established community, but rather complement and connect the surrounding established neighborhoods.

10b. Project Consistency with Land Use Plans and Policies

The project would be subject to policies of the Morgan Hill General Plan Community Development Element. The project would be consistent with pertinent policies of the General Plan. Relevant policies and project consistency with these policies are discussed below:

General Plan Policies Project Consistency Community Development Element Policy 2a. Encourage the orderly development of the Consistent. Since the project site is surrounded by city, with concentric growth and infill of existing residential development, the project would be consistent development areas. with Policy 2a by addressing the need for development of infill parcels. In addition, the site is designated in the *Policy 2c. Consider land within or adjacent to the City* Morgan Hill General Plan as Single- Family Medium as available for urban development only when it is Density Residential (3 to 5 dwelling units per acre), included within the Urban Service Area and can be which would be consistent with Policy 2c. developed in a manner which will be cost-effective to the *City....* Policy 6a. Avoid development in areas of natural Consistent. The project site is located outside of the hazards such as landslide and flood prone areas. 100-year floodplain of the closest natural drainage channel, Coyote Creek, and is served by City drainage Policy 6c. Evaluate potential impacts of development facilities in East Dunne and Murphy avenues. The projects on adjacent uses in initial environmental proposed project would need to conform to the City's assessments and EIRs. Standard Conditions of Approval as well as specific conditions controlling includes plans for the development of an on-site storm water detention basin to restrict site runoff to predevelopment levels. Policy 7a. Plan for a population of 48,000 residents in Consistent. The Residential Development Control System (RDCS) implements these policies by controlling annual population growth based on a 2020

Policy 7b. Plan for an approximate 70/30 ratio of single

General Plan Policies

Project Consistency

family detached to single family attached and multipopulation cap of 48,000. Since annual development family housing for all future residential development. allotments are allocated in accordance with the RDCS, which takes into account the impact of the proposed Policy7c. Under the Residential Development Control development on public facilities and services, System (RDCS) procedures, continue to emphasize development of the project site could not occur until single family development in the distribution of units public facilities and services were available. Public between single family and multi-family development. facility and service agencies have indicated that Policy 7g. Continue to provide for a full range of facilities and services are available at the project site residential land use densities and building types, (see Sections 14, Public Services and 17, Utilities and including mobile home, within the General Plan and Service Systems for more discussion). Zoning Ordinance. The proposed project is consistent with the City's Policy 7i. Encourage a mix of housing types and lot objective of providing a variety and mix of housing sizes within residential projects with five or more lots or types with an emphasis on encouraging single-family units. development in the community. Policy 71. Encourage preservation and rehabilitation of single family neighborhoods within the city. Policy 8c. Encourage future residential development Consistent. The proposed residential development projects where local streets are safe, convenient and

aesthetically pleasing; and where elementary schools and parks are centrally located to serve the immediate residential area.

includes construction of one public access road and two private cul-de-sacs on the project site.

Policy 19g. To allow school facilities to be used most efficiently and to minimize busing needs, residential development should occur in areas served by existing schools. Contiguous residential development and infill development within built-up areas should be encouraged.

Consistent. The proposed residential development is infill development that is contiguous to existing residential development.

The project site is zoned as R-1, 7,000, Medium-Density Residential. The R-1 district permits one singlefamily detached dwelling per lot, duplex of single-family attached dwellings, small residential care facilities, manufactured homes, small and large family day care homes, and secondary dwelling units. The R-1 district is intended to stabilize and protect the residential character of neighborhoods and to promote and encourage a suitable environment for family life. The R-1 district is intended for the suburban family home and the community services related to these residential uses.

The proposed zoning for the project site includes a Planned Development (PD) overlay zoning district. The purpose of the Planned Development (PD) overlay district is to: facilitate and promote coordination of design, access, use intensity, and other features associated with development of mixed use developments, multiple adjacent properties or large single properties; encourage flexibility of site planning when it will enhance the area in which it is proposed; allow construction and reservation of housing units for lower income or senior households, and to regulate the conversion of mobile home parks to resident ownership parks or other uses. The review and approval of the PD overlay district is subject to the provisions of Chapter 18.30 of the City of Morgan Hill Municipal Code.

As required by City ordinance, the project applicant has prepared a Site Development Plan for the development of 14 residential lots on the 3.65-acre parcel. The development of 12 new single-family detached dwellings along with the retention of 2 existing homes on the project site would be consistent with permitted uses in the R-1 zone. The project site plan indicates that the single-family residences would front on a new public street extending from Murphy Avenue onto the project site, and two cul-desacs that would extend from the site's public road. Four of the new residences would front on the public road and the remaining ten would be served the two internal streets.

The project design includes the development of open space areas along the project site's frontage along East Dunne Avenue and Murphy Avenue. The open space areas would contain underground infiltration tank units for the storage and treatment of storm runoff from the project development's impervious surfaces. Additionally, the project would install landscaping including street trees along all site roads and on front yards of residential lots. The project would also provide 28 new off-street parking spaces and over 45 on-street parking spaces for guests.

Lands surrounding the project site are currently developed with various residential uses that are consistent with residential development of the subject property. These land uses include residential and permitted uses within residential planned development zoning districts. The zoning districts surrounding the project site include similar properties zoned medium-density residential (R-1, 7,000 RPD) on the east and south. Parcels to the west are designated Commercial use by the General Plan and are zoned PUD, Planned Unit Development District.

The proposed residential development would be similar to existing residential uses that presently adjoin the project site and vicinity to the east and north, and would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

10c. Conflict with Habitat Conservation or Natural Community Conservation Plans

The project site is within the SCVHP permit area, and urban development is a "Covered Activity" under the plan. Land cover in the Project site is classified as Urban – Suburban. No SCVHP land cover fees apply to the project given its location in a "No Land Cover Fee" zone.

Less than

Issues (and Supporting Information Sources)	Potentially Significant Impact	Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact	
11. Mineral Resources - Would the project:					
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				\boxtimes	
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?					
11a, 11b. Mineral Resources					
The Morgan Hill General Plan does not identify any regional within the City of Morgan Hill.	The Morgan Hill General Plan does not identify any regionally or locally important mineral resources within the City of Morgan Hill.				
Issues (and Supporting Information Sources)	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact	
12. Noise - Would the project result in:	•	•	•		
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?					
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?			\boxtimes		

Issues (and Supporting Information Sources)	Potentially Significant Impact	Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact	_
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			\boxtimes		
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?		\boxtimes			
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				\boxtimes	
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				\boxtimes	

Less than

A detailed noise study was completed as part of this Initial Study by Edward L. Pack Associates, Inc. (ELPA) in October 2015 and it is included in **Attachment 5** of this report and summarized below.

Existing Noise Environment

Noise-Sensitive Receptors. Certain land uses are particularly sensitive to noise, including schools, hospitals, rest homes, long-term medical and mental care facilities, places of worship, and parks and recreation areas. Residential areas are also considered noise sensitive, especially during the nighttime hours. Existing sensitive receptors located adjacent to the site include single-family residences located adjacent to the site's eastern boundary, Advent Lutheran Church adjacent to the site's southern boundary, and Nordstrom Elementary School across East Dunne Avenue to the northeast of the site.

Existing and Future Noise Levels. The primary sources of noise at the project site are traffic on East Dunne Avenue, Murphy Avenue, and the State Route 101 freeway. To determine the existing noise environment at the site, continuous recordings of the sound levels were made at two locations on September 24- 25, 2015: Measurement Location 1 was 68 feet from the centerline of East Dunne Avenue corresponding to the proposed minimum building setback from the road, while Location 2 was 41 feet from the centerline of Murphy Avenue at the proposed lot line of Lot 3. Noise measurement locations and results are presented in Figure 3 and Appendix C, respectively, of Attachment 5.

Noise measurements indicate that existing noise levels along East Dunne Avenue ranged from approximately 62 to 66 dBA during the day and about 51 to 60 dBA during the night at 68 feet from the centerline, while noise levels along Murphy Avenue ranged between approximately 58 and 62 dBA during day and 50 and 61 during the night at 41 feet from the centerline. Maximum noise levels along East Dunne Avenue ranged from about 78 to 91 dBA during the day and 73 to 84 dBA during the night (Location 1), and 71 to 93 dBA during the day and 67 to 78 dBA during the night along Murphy Avenue (Location 2). Since traffic noise dissipates at a rate of 3 to 6 dB for each doubling of the distance from the source to the received, other locations on the site that are at greater distances from these roadways would have lower exterior noise levels.

As indicated in the Morgan Hill Circulation Element, future (2030) traffic volumes on East Dunne Avenue are predicted to increase from 12,040 average daily traffic (ADT) in 2009 to 16,004 ADT in 2014, Applying the 0.72% per year growth rate for 2030, the traffic volume is estimated to increase to 17,951 ADT. This increase in traffic volume yields a 1-dB increase in the traffic noise levels.

Future traffic volume data for Murphy Avenue are not available. For the purposes of this study, traffic growth on Murphy Avenue is assumed to be similar to the projected growth rate on East Dunne Avenue adjacent to the site. Therefore, traffic volume on Murphy Avenue is estimated to increase from the existing 2,763 ADT to 3,099 ADT in 2030. This increase in traffic volume also yields a 1-dB increase in the traffic noise levels.

To determine the future Highway 101 traffic volume, an annual average growth rate was calculated for the past 20 years of traffic volumes based on the 1994 traffic volume (77,000 ADT) and 2014 traffic volume (122,000 ADT). The annual average growth rate over those 20 years was calculated to be 2.337% per year. Applying this growth rate to the future 16 years, the traffic volume for 2030 was calculated to be 176,363 vehicles ADT. This increase in traffic volume yields a 2-dB increase in the Highway 101 traffic noise levels.

Applicable Noise Standards and Significance Criteria

Morgan Hill General Plan Noise Element. Table 9 of the City of Morgan Hill Noise Element present acceptable exterior noise level standards, utilizing the Day-Night Level (DNL) 24-hour descriptor to define acceptable noise exposures for various land uses. These noise standards indicate that exterior noise levels up to 60 decibels (dB) DNL is considered "normally acceptable" for single-family residential uses. However, in areas where noise levels are between 55 dB and 70 dB DNL, new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.

A limit of 45 dB DNL is specified for interior living spaces. In addition, the Noise Element specifies that when the exterior noise exposure is greater than 60 dB DNL, the *maximum instantaneous* noise levels (L_{max}) shall not exceed 50 dBA in bedrooms and 55 dBA in other living spaces.

12a. Noise Compatibility of Proposed Uses

Exterior Noise Exposure Levels. The existing and future noise exposures at the proposed minimum building setback of 62 feet from the centerline of East Dunne Avenue was calculated to be 66 and 67 dB DNL under existing and future traffic conditions, respectively. These noise exposures would exceed the City of Morgan Hill Noise Element standards for residential uses by up to 7 dB. However, provision of noise control barriers, as specified in Mitigation Measure NOI-1, would reduce noise impacts on private exterior areas to a less-than-significant level.

The existing and future noise exposures at the proposed minimum building setback of 56 feet from the centerline of Murphy Avenue was calculated to be 62 dB DNL under existing traffic conditions, with 58 dBA due to State Route 101 freeway traffic, 56 dB due to traffic on East Dunne Avenue, and 58 dB due to traffic on Murphy Avenue. Under future traffic conditions, noise exposure is expected to increase to 64 dB DNL, with 60 dBA due to State Route 101 freeway traffic, 57 dB due to traffic on East Dunne Avenue, and 59 dB due to traffic on Murphy Avenue. These noise exposures would exceed the City of Morgan Hill Noise Element standards for residential uses by up to 4 dB. Such levels would occur at the closest lot line to Murphy Avenue, a significant noise impact. However, provision of noise control barriers, as specified in Mitigation Measure NOI-1, would reduce noise impacts at private exterior areas to a less-than-significant level.

The exterior maximum noise levels at the most impacted proposed building setback from East Dunne Avenue were measured to range from 83 dBA (Lmax) during the day to 78 dBA (Lmax) during the night. The exterior maximum noise levels at the most impacted proposed building setback from Murphy Avenue was measured to range from 79 dBA (Lmax) during the day to 72 dBA (Lmax) during the night (Table I of Attachment 5).

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Interior Noise Exposure Levels. To determine the interior noise exposures in project living spaces, a 25-dB reduction was applied to the exterior noise exposures at the building setbacks to represent the attenuation provided by a typical building shell under a closed window condition. The closed window condition is used in this study as full-time ventilation is proposed to be provided that will allow the residents to keep their windows closed for noise control at all times without further specification. This condition also includes the installation of standard dual-pane thermal insulating windows.

The interior noise exposures in the living spaces closest to East Dunne Avenue would be 40 and 41 dB DNL under existing and future traffic conditions. The interior noise exposures in the living spaces closest to Murphy Avenue would be 37 and 39 dB DNL under existing and future traffic conditions, respectively. Thus, the noise exposures would meet the 45-dB DNL limit of the City of Morgan Hill Noise Element standards.

The interior L_{max} noise levels in the most impacted living spaces closest to East Dunne Avenue and Murphy Avenue would be up to 58 dBA and 54 dBA, respectively. The average interior nighttime L_{max} noise levels in the most impacted bedrooms closest to East Dunne Avenue and Murphy Avenue would be up to 53 dBA and 47 dBA, respectively (Table II of Attachment 5). Thus, the interior maximum noise levels would exceed the 50-dBA limit for bedrooms by up to 3 dBA and the 55-dBA limit for other living spaces by up to 3 dBA, a significant noise impact.

Since interior spaces of all project units would meet applicable City noise limits, noise mitigation measures for the interior living spaces would not be required. However, implementation of noise attenuation measures for interior spaces, as specified in Mitigation Measure NOI-2, would reduce noise impacts in interior spaces to a less-than-significant level.

12b. Groundborne Noise and Vibration

The closest existing structures that would be subject to construction-related vibration effects would be structures located to the east, as close as approximately 25 feet from the project site's eastern boundary. At 25 feet, groundborne vibration and noise levels generated by most types of construction activities³⁴ would not exceed threshold levels for cosmetic damage to structures.³⁵ Operation of impact or vibratory pile drivers or large truck-mounted compactors can generate higher vibration levels than other construction equipment. At distances of less than 50 feet, vibration from operation of such equipment could disturb neighbors and cause cosmetic damage to adjacent structures. However, pile driving equipment is not proposed to be used during project construction and vibratory compactors are not expected to operate within 50 feet of existing residences to the east. At this distance, vibration levels from vibratory rollers (typically associated with road construction) would not exceed threshold levels for cosmetic damage to structures.³⁶ Therefore, construction-related vibration effects would have a less-than-significant vibration impact.

Groundborne noise refers to a condition where noise is experienced inside a building or structure as a result of vibrations produced outside of the building and transmitted as ground vibration between the

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³⁴ Bulldozers, jackhammers, and loaded trucks typically generate vibration levels on the order of 0.003 to 0.089 inches per second, peak particle velocity (in/sec PPV) at 25 feet (U.S. Federal Transit Administration, 2006. *Transit Noise and Vibration Impact Assessment*. May. Available online at http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf.

³⁵ The American Association of State Highway and Transportation Officials (AASHTO) recommends a threshold of 0.5 in/sec PPV for transient and intermittent vibrations.

³⁶ Vibratory rollers can generate vibration levels of up to 0.210 in/sec PPV at 25 feet. At 50 feet, vibration levels attenuate to 0.098 in/sec PPV, which is well below the 0.5 in/sec PPV threshold.

source and receiver. Groundborne noise can be problematic in situations where the primary airborne noise path is blocked, such as in the case of a subway tunnel passing in close proximity to homes or other noise-sensitive structures. However, proposed noise and vibration-generating construction activities associated with the proposed project would involve techniques that primarily generate airborne noise and surface vibration. Any potential groundborne noise from construction activities would be imperceptible, and therefore would have no impact.

12c. Long-term Noise Increases

Policy 7e of the Noise Element defines the following traffic-related noise level increases associated with new projects as significant, if: (a) the noise level increase is 5 dB DNL or greater, with a future noise level of less than 60 dB DNL; or (b) the noise level increase is 3 dB DNL or greater, with a future noise level of 60 dB DNL or greater. As indicated above, existing and future noise levels on East Dunne Avenue and Murphy Avenue are 62 dB DNL or greater. Therefore, a 3 dB DNL noise increase or greater would be considered significant. As indicated in the ELPA report, East Dunne Avenue carried 16,004 ADT (average daily traffic) in 2014, while traffic levels on Murphy Road are estimated to be 2,763 ADT. Under the extremely conservative and unlikely event that all project-related traffic would travel on East Dunne Avenue and Murphy Avenue to access the site, the project would generate approximately 120 net new trips per day on Murphy Avenue and East Dunne Avenue, which would constitute traffic increases of 0.7% and 4%, respectively. Such traffic increases on either of these roads would result in a noise increase of less than 1 dB, which would be less than significant.

12d. Short-Term Noise Increases

Chapter 8.28 of the Morgan Hill Municipal Code³⁷ prohibits construction activities (including operation of any pile driver, steam shovel, pneumatic hammer, derrick, steam or electric hoist or other appliance) between 8:00 p.m. and 7:00 a.m., Monday through Friday, and between 6:00 p.m. and 9 a.m. on Saturdays. Construction activities may not occur on Sundays or federal holidays. The Morgan Hill Municipal Code does not specify any short-term noise level limits.

Project construction would result in temporary short-term noise increases due to the operation of heavy equipment. Construction equipment generates noise levels in the range of 77 to 97 dBA (Leq) at 25 feet from the source. The potential for construction-related noise increases to adversely affect nearby residential receptors would depend on the location and proximity of construction activities to these receptors. Temporary disturbance (e.g., speech interference) can occur if the noise level in the interior of a building exceeds 45 to 60 dBA. To maintain such interior noise levels, exterior noise levels at the closest residences (with windows closed) should not exceed 80 dBA and this exterior noise level is used as a significance threshold. The closest existing residential receptors are located approximately 25 feet to the east, construction noise would range from 77 to 97 dBA, and such noise increases would approach and exceed the 80-dBA threshold, which would be a noticeable noise increase. However, over the course of a construction day, noise exposures at these residences are estimated to be up to 65 dB DNL, a significant temporary noise impact. However, implementation of noise controls specified in Mitigation Measure NOI-3 would reduce this potential impact to less than significant.

³⁷ Available online at http://search.municode.com/html/16502/index.html.

³⁸ In indoor noise environments, the highest noise level that permits relaxed conversation with 100% intelligibility throughout the room is 45 dBA. Speech interference is considered to become intolerable when normal conversation is precluded at 3 feet, which occurs when background noise levels exceed 60 dBA (U.S. Environmental Protection Agency, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (Condensed Version)*, 1974).

12e. Airport-Related Issues

The project site is not located within an airport land use plan. There is no public airport, public use airport, or private airstrip located within two miles of the project site. The proposed project would not expose people residing or working in the area to excessive noise levels. Therefore, there would be no airport-related noise impact.

Mitigation Measures - Noise and Vibration (NOI)

To reduce the significant noise impacts identified above for project residences located along East Dunne Avenue and Murphy Avenue, the following noise attenuation measures will be incorporated into the project design to ensure that acceptable exterior and interior noise levels are achieved, reducing identified impacts to a less-than-significant level:

- **NOI-1:** Exterior Noise Control. To achieve compliance with the 60 dB DNL limit of the City of Morgan Hill Noise Element standards for the noise-impacted rear yards along East Dunne Avenue and Murphy Avenue, the following noise control barrier shall be required:
 - Construct six-foot high acoustically-effective barriers at the side and rear yards of Lots 2, 3, 7, 8 and 14 (see Figure 1 of Attachment 5. The barrier height is in reference to the nearest building pad elevation. To control flanking noise, the barriers at the fronts of the houses shall be turned to connect air-tight to the sides of the houses. In addition, the barrier behind Lot 14 shall be connected air-tight to the existing barrier along the easterly property line.

To achieve an acoustically-effective barrier, the barrier must be constructed air-tight, i.e., without cracks, gaps or other openings, and must provide for long term durability. Barriers can be constructed of masonry, wood, concrete, stucco, earth berm or a combination thereof and must have a minimum surface weight of 2.5 pounds per square foot. If wood fencing is used, homogeneous sheet materials are preferable to conventional wood fencing as the latter has a tendency to warp and form openings with age. However, high quality, air-tight, tongue-and-groove, board and batten or shiplap construction can be used. All connections with posts, pilasters or building shells must be sealed air-tight. No openings are permitted between the upper barrier components and the ground. Gates may be incorporated into the barriers, however, they must be meet the minimum surface weight requirement and must seal tight when closed. The gap at the bottom of the gate shall be less than one inch.

- **NOI-2:** Interior Noise Control. To achieve compliance with the City's 55-dBA Lmax limit for living spaces and the 50-dBA Lmax limit for bedrooms, the following window controls shall be required:
 - Maintain closed at all times all windows and glass doors that are proposed in bedrooms and living spaces on the second floors and unshielded first floors (i.e., a view to the road beyond a noise control barrier) located within 190 feet of the East Dunne Avenue centerline and with a direct or side view to this roadway (west, north and east facades). Shielded facades include the first floors of the rear and side facades of Lots 6, 7, 8, 12, 13, and 14. See Figure 2 of Attachment 5 for the locations of the noise impacted building facades and recommended STC ratings. At impacted spaces located within 120 feet of the centerline, windows and glass doors rated minimum Sound Transmission Class (STC) 31 shall be installed. At the noise impacted spaces between 120 feet and 190 feet of the centerline, install windows and glass doors rated minimum STC 28.

Some type of mechanical ventilation to assure a habitable environment must be provided, per the Mechanical Code. Noise control windows are to be operable, as the requirement

does not imply a "fixed" condition. In addition to the required STC ratings, the windows and doors shall be installed in an acoustically-effective manner. To achieve an acoustically-effective window construction, the sliding window and door panels must form an air-tight seal to the outside environment when in the closed position and the window frames must be caulked to the wall opening around their entire perimeter with a non-hardening caulking compound to prevent sound infiltration. Exterior doors must seal air-tight around the full perimeter when in the closed position.

Please be aware that many dual-pane window and glass door assemblies have inherent noise reduction problems in the traffic noise frequency spectrum due to resonance that occurs within the air space between the window lites, and the noise reduction capabilities vary from manufacturer to manufacturer. Therefore, the acoustical test report of all sound rated windows should be reviewed by a qualified acoustician to ensure that the chosen windows will adequately reduce traffic noise to acceptable levels.

In addition, the following general building shell controls are also recommended to ensure the greatest potential exterior-to-interior attenuation where closed windows are required (see Appendix B of Attachment 5:

- Unshielded entry doors having a direct or side orientation toward the primary noise source must be 1-5/8" or 1-3/4" thick, insulated metal or solid-core wood construction with effective weather seals around the full perimeter.
- If any penetrations in the building shell are required for vents, piping, conduit, etc., sound leakage around these penetrations can be controlled by sealing all cracks and clearance spaces with a non-hardening caulking compound.
- Ventilation devices shall not compromise the acoustical integrity of the building shell.
- **NOI-3:** Implement Construction Noise Controls. The following measures shall be required if future residences on the property immediately to the northwest are constructed and occupied at the time of project construction. However, these measures are recommended in any case to help minimize the potential for annoyance at nearby residential receptors:
 - Quiet or "new technology" equipment should be used wherever feasible. All internal combustion engines used at the project site should be equipped with mufflers (as recommended by the vehicle manufacturer). In addition, all equipment should be in good mechanical condition so as to minimize noise created by faulty or poorly maintained engine, drive-train and other components.
 - Noisy operations shall be scheduled for the daytime hours (7:00 a.m. to 8:00 p.m., Monday through Friday and 9:00 a.m. to 6:00 pm. on Saturdays) in accordance with time limits specified in the City of Morgan Hill Zoning Ordinance.
 - All diesel-powered equipment should be located more than 200 feet from any residence to the extent feasible if the equipment is to operate for more than several hours per day.
 - Locate stockpiled materials so that they can help block construction noise at nearby sensitive receptors.
 - Noise reduction benefits could also be achieved by appropriate selection of equipment utilized for various operations (subject to equipment availability and cost considerations). The following measures are recommended to reduce noise impacts on nearby residents:
 - <u>Earth Removal</u>: Use scrapers as much as possible for earth removal, rather than the noisier loaders and hauling trucks.

- <u>Backfilling</u>: Use a backhoe for backfilling, as it is less costly and quieter than either dozers or loaders.
- <u>Ground Preparation</u>: Use a motor grader rather than a bulldozer for final grading.
- <u>Building Construction</u>: Powers saws should be shielded or enclosed where practical to decrease noise emissions. Nail guns should be used where possible as they are less noisy than manual hammering.

<u>Construction Phasing</u>: Construct buildings or other significant structures at the site perimeter to help shield existing sensitive receptors from noise generated on the site.

Issues (and Supporting Information Sources) 13. Population and Housing - Would the project:	Potentially Significant Impact	Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?			\boxtimes	
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				\boxtimes

13a. Growth-Inducement Impacts

In November 2004, the Measure C initiative was approved by voters, which extended the City's Residential Development Control System (RDCS) until 2020. Measure C caps the population at 48,000 for the year 2020, and requires development allotments for all residential development. The project proposed for the 3.65-acre site presently has 13 allotments. These allotments limit residential growth on an annual basis to ensure that the population cap is not reached until 2020. Therefore, the effects of the growth induced by the project proposal would be less than significant since new population could not occur until development allotments are obtained for the project area. These allotments ensure that growth induced by the project would be within the City's planned growth level.

13b, 13c. Displacement of Housing or Residents

The subject property is currently supports two single-family residences. The proposed project would preserve the two existing houses, subdivide the site into 14 lots, and construct 12 new residences. Therefore, no displacement of any existing residences would occur as a result of project development. The proposed project would provide 12 additional residential units on the project site to serve the community's future housing needs. Based upon U.S. Census Bureau information, the project would result in the addition of 37 new residents to the City's population.³⁹

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³⁹ United States Census Bureau, 2013. Morgan Hill Population and Households. Accessed at: http://quickfacts.census.gov/qfd/states/06/0649278.html

	Potentially Significant	Impact With Mitigation	Less Than Significant	No
Issues (and Supporting Information Sources)	Impact	Incorporated	Impact	Impact
14. Public Services -				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?				
Police protection?				
Schools?				
Parks?			\boxtimes	
Other public facilities?	$\overline{\Box}$		$\overline{\Box}$	$\overline{\boxtimes}$

Less than

14a. Public Services

The City of Morgan Hill contracts with CAL FIRE (State Department of Forestry and Fire Protection) for fire protection services. There are three fire stations located within the city boundaries: El Toro Station, located at 18300 Monterey Road; Dunne-Hill Station, located at 2100 East Dunne Avenue; and the CAL FIRE station at 15670 Monterey Road. The project site is located approximately 0.75 mile west of the Dunne-Hill Station, 1.4 miles northeast of the CAL FIRE station, and approximately 2.1 miles southeast of the El Toro station. With the project's close proximity to the Dunne-Hill station, the project site is within the five-minute response boundary of this fire station.

The Morgan Hill Police Department provides police protection services to incorporated areas in the project vicinity. The project site is located within the Department's normal patrol routes due to other nearby residential development located within the City.

The Morgan Hill Unified School District (MHUSD) operates public education facilities that serve the project site and surrounding area. The City of Morgan Hill is served by eight elementary schools, two middle schools, two high schools, one continuation school, and one community adult school. Current student population in the District is 9,000⁴⁰ pupils. The existing school facilities have sufficient available capacity to accommodate the approximately nine students⁴¹ that would be generated by the proposed project. Students from the proposed project would attend Nordstrom Elementary School, Britton Middle School, and Sobrato High School.

The project would incrementally increase demand for fire and police protection services, and generate new students at local schools. Both the City of Morgan Hill and Morgan Hill Unified School District collect development impact fees to help pay for fire and police protection capital improvements and finance additional school facilities. In general, payment of these fees is considered adequate to mitigate the project's impact on these services to a less-than-significant level. However, the City's Residential Development Control System provides more direct assurance that any new residential development,

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⁴⁰ California Department of Education, Educational Demographics Unit, 2015. http://dq.cde.ca.gov/dataquest/dataquest.asp

⁴¹ Based upon a MHUSD student generation rate of 0.7 K-12 students per household.

⁴² Ms. Anessa Espinosa, Facilities Director, MHUSD, telephone communication November 13, 2015.

including future residential development on the project site, would not cause significant adverse impacts on these and other public services. Development allotments are awarded based on the number of points scored for all development proposals for each year and the point scale takes into account the impact of the proposed development on the following public services: schools, fire and police protection, traffic and other municipal services. Therefore, development allotments are not awarded to any development proposals until adequate services are available.

Lece than

Issues (and Supporting Information Sources)	Potentially Significant Impact	Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
15. Recreation -	•	•		
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?			\boxtimes	

15a. Demand for Recreational Facilities

Proposed subdivision of the 3.65-acre project site would ultimately allow new residential development, which in turn would induce population growth in the Morgan Hill area. Project-related population increases of 37 additional residents would incrementally increase demand on existing recreational facilities. However, the City's Residential Development Control System provides assurance that any new residential development, including future residential development on the project site, would not cause significant adverse impacts on recreational facilities or on public services and utilities. Development allotments are awarded based on the number of points scored for all development proposals for each year, and the point scale takes into account the impact of the proposed development on recreational facilities.

15b. Impacts Related to Construction of Recreational Facilities

The project would include a x-acre open space area along the periphery of the proposed subdivision, and includes private open space as backyards for all of the residential lots. Construction of any future recreational uses in the common open space area would not have a significant effect on the environment. The closest recreational facilities to the site are at Nordstrom Park, located across East Dunne Avenue from the project site. The park includes separate playgrounds for toddlers and older children, picnic tables and benches, and extensive grass field, and paved paths throughout. The project's increase of less than 0.1 percent in the City's population would be less than significant and, therefore, the impact related to the construction project recreational facilities would be less than significant.

Issues (and Supporting Information Sources)	Potentially Significant Impact	Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
16. Transportation/Traffic - Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?			\boxtimes	
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?			\boxtimes	
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				\boxtimes
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				\boxtimes
e) Result in inadequate emergency access?				\boxtimes
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?				\boxtimes

Less than

16a, 16b, 16e. Impacts on the Circulation System, Conflicts with Congestion Management Program, and Traffic Hazards

Regional access to the project site is provided by State Highway 101, approximately 0.3 mile west of the project site, and the SR 101/East Dunne Avenue interchange. Local access to the site is provided by East Dunne Avenue and Murphy Avenue. East Dunne Avenue extends along the site's northern boundary, while Murphy Avenue extends along the site's western boundary.

The proposed 14-unit residential lot project would construct 12 new residences and preserve two existing single-family homes on the site. Residential uses currently generate daily vehicle trips from the site. The additional 12 single-family homes are expected to generate a total of 120 daily trips with 12 trips during the AM peak hour and 12 additional trips during the PM peak hour. Due to the small size of the proposed project, the impacts on adjacent and nearby roads and intersections are expected to be minimal. There is adequate available traffic capacity on adjacent and nearby streets and intersections to accommodate project-related traffic increases, and no significant impacts are anticipated. The East Dunne Avenue/Murphy Avenue intersection currently operates at LOS B during the AM and PM peak hours, and is projected to operate acceptably at LOS B- (AM) and C (PM) under future (2030) conditions.⁴³ Given the project's small size, project-related traffic increases would have a less-than-significant impact on

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⁴³ Fehr & Peers, 2013., Final Transportation Impact Analysis: South-East Quadrant General Plan Amendment. December 12..

traffic capacity in the project area and the project's contribution to future (2030) cumulative traffic increases would be less than cumulatively considerable.

According to guidelines published by the Santa Clara Valley Transportation Authority (VTA), the congestion management agency for Santa Clara County, a detailed traffic study is required only if the project is estimated to generate 100 or more peak hour trips. The City has adopted its own guidelines that are generally consistent with the County. For projects generating less than 100 peak hour trips, such small increases in traffic are considered less than significant.

The project would provide 28 covered parking spaces (two covered spaces per unit) and 47 on-street parking spaces, which would meet the number of spaces required by City code: a minimum of two covered parking spaces per dwelling unit and one guest parking space for each four dwelling units.

Site access and internal streets on the project site would be required to conform to City design standards, thereby ensuring the use of approved transportation system design elements as part of the project plans. The project proposes to extend a public roadway from Murphy Avenue along the length of the site's southern boundary. Two private cul-de-sacs would extend north from the public road to serve site residences. City review of the project plans indicates that the proposed street design for the two proposed cul-de-sacs includes street radii that are 4 ft. short of meeting City street standards. As a result, the cul-de-sacs are proposed as private streets, with the reduced radii requested as an exception as part of the PD application.

16c. Air Traffic Patterns

The project site is not located within an airport land use plan, nor is there a public airport, public use airport, or private airstrip located in the project vicinity. The San Martin Airport, approximately 3.7 miles to the south of the project site, is the closest airport to the property. Therefore, the project would have no impact on air traffic patterns, would not directly increase air traffic levels, nor would there be any change in location that results in substantial safety risks.

16e. Emergency Access

The project site has frontage on both East Dunne Avenue and Murphy Avenue, but access to project units would be restricted to a public street that would extend along the site's southern boundary and connect to Murphy Avenue. An emergency vehicle access (EVA) is proposed at the east end of the eastern private street and would connect to East Dunne Avenue. With such an access configuration, there would be no impact on emergency access.

16f. Conflicts with Alternative Transportation (Pedestrian, Bicycle, and Transit Access)

The project site's frontage along the south side of East Dunne Avenue would include provision of a sidewalk. Although sidewalks are discontinuous along this section of East Dunne Avenue, the project's construction of these sidewalks would contribute to improved pedestrian access in the project area. Sidewalks would also be constructed along the east side of Murphy Avenue, for the new public street proposed along the site's southern boundary, and along the two internal private roads proposed for the site, providing pedestrian access from the project's private drives to Murphy Avenue. An EVA proposed at the north end of the project's planned eastern private drive would also provide pedestrian access to the sidewalk on East Dunne Avenue.

A Class III bicycle route extends along Murphy Avenue, between Diana Avenue and Middle Avenue. A Class II bike lane is provided on East Dunne Avenue between Murphy Avenue and Hill Road. The proposed project would improve the Murphy Avenue R-O-W along the project site's frontage on this street and facilitate bicycle travel along this part of the roadway.

Transit services in the project vicinity are limited. Local Route 16 is a community bus route serving parts of the community to the north of the project area, along Main Avenue, Cochrane Road, and Burnett Avenue. The Morgan Hill Caltrain Station is located approximately one mile west of the project site. In addition to Caltrain service to San Jose and other Bay Area communities, the Amtrak Thruway Express Bus Route 55 connects at the Morgan Hill Caltrain Station and provides express bus service between Monterey and San Jose. Pedestrian travel and access to these transit facilities would be improved through the project's construction of sidewalks around the project site, connecting to the existing sidewalk along the south side of East Dunne Avenue. Consequently, the proposed project would support rather than conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities (no impact).

	Potentially Significant	Less than Significant Impact With Mitigation	Less Than Significant	No
Issues (and Supporting Information Sources)	Impact	Incorporated	Impact	Impact
17. Utilities and Service Systems – Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				\boxtimes
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				
e) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the projects projected demand in addition to the providers existing commitments?				\boxtimes
f) Be served by a landfill with sufficient permitted capacity to accommodate the projects solid waste disposal needs?				\boxtimes
g) Comply with federal, state, and local statutes and regulations related to solid waste?				\boxtimes

17a, 17e. Wastewater Facilities and Service

Wastewater generated in Morgan Hill is treated by the joint Gilroy/Morgan Hill Wastewater Treatment Plan located in Gilroy. There are municipal sewer lines in East Dunne Avenue and Murphy Avenue, currently serving existing development in the project vicinity.

17b, 17d. Water Facilities and Service

Municipal water service in the project area is provided by the City of Morgan Hill through water service lines in East Dunne Avenue and Murphy Avenue. The City's water supply is from groundwater in aquifers underlying the City.

Groundwater levels are not expected to drop based on the precautions taken by the City of Morgan Hill, as well as the Santa Clara Valley Water District. However, it should be noted that the groundwater level in the both the Llagas Subbasin and the Coyote Valley subarea have been recorded to be strongly dependent on the annual rainfall. Groundwater levels drop sharply and recover quickly during dry and wet

periods. Precautions taken by the City and SCVWD to manage groundwater levels include constant groundwater level monitoring, groundwater quality monitoring, and water conservation efforts throughout the District.

The California State Legislature passed AB 797, the Urban Water Management Planning Act (Act) of 1983, which became effective January 1, 1984. The Act requires every urban water supplier providing water for municipal purposes to more than 3,000 customers, or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an Urban Water Management Plan (UWMP). The City has prepared the City of Morgan Hill 2010 Urban Water Management Plan to assist it and other agencies in the coordination of water planning efforts in order to ensure adequate water supplies are available to serve the community.

17c. Stormwater Drainage Facilities

At present, there are no storm drainage facilities located on the project site, but there are existing storm drains in East Dunne Avenue and Murphy Avenue adjoining the project site. The storm flows from the proposed project would be directed from its internal collection, treatment, and storage tanks to the 24-inch municipal storm drain in Murphy Avenue. For more discussion on storm drainage, please see Section 9, *Hydrology and Water Quality*.

17f, 17g. Solid Waste

South Valley Refuse Disposal provides solid waste collection service to the project area. Solid waste is disposed at the sanitary landfill in Pacheco Pass in Gilroy.

The project would incrementally increase demands on the above-listed public services and facilities, but it is anticipated that the project will be responsible for extending these facilities onto the project site and completing necessary improvements to meet fire flow requirements and any other off-site utility improvements, if needed. In addition, the City's Residential Development Control System provides more direct assurance that any new residential development, including future residential development on the project site, would not cause significant adverse impacts on the level of service of utilities for current and future residents.

Issues (and Supporting Information Sources) 18. Mandatory Findings of Significance -	Potentially Significant Impact	Less than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		\boxtimes		
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?				

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		Less than		
		Significant		
	Potentially	Impact With	Less Than	
	Significant	Mitigation	Significant	No
Issues (and Supporting Information Sources)	Impact	Incorporated	Impact	Impact
c) Does the project have environmental effects which will cause				
substantial adverse effects on human beings, either directly or			\boxtimes	
indirectly?				

18a, 18c. Significant Impacts on the Natural and Man-Made Environments

With mitigation measures specified above in Sections 3 (Air Quality) and 12 (Noise), the proposed project would not degrade the quality of the environment. As indicated in the above discussion, the project also would not substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory.

18b. Cumulative Impacts

The proposed project's action entailing subdivision of the 3.65-acre project parcel into 37 residential lots would not cause environmental impacts that would be cumulatively considerable when evaluated in conjunction with other current or probable projects. In November 2004, the Measure C initiative was approved by voters, which extended the City's Residential Development Control System until 2020. Measure C caps the population at 48,000 for the year 2020, and requires development allotments for all residential development. The project's contribution to cumulative growth effects on the city would be less than cumulatively considerable since new population could not occur until development allotments are obtained for the project site. These allotments ensure that growth induced by the project would be within the City's planned growth level.

ATTACHMENT 1

AIR QUALITY

CALEE MOD OUTPUTS

CalEEMod Version: CalEEMod.2013.2.2 Page 1 of 29

Busk Project

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San Francisco Bay Area Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	12.00	Dwelling Unit	3.90	21,600.00	34

1.2 Other Project Characteristics

UrbanizationUrbanWind Speed (m/s)2.2Precipitation Freq (Days)64

Climate Zone 4 Operational Year 2017

Utility Company Pacific Gas & Electric Company

 CO2 Intensity
 641.35
 CH4 Intensity
 0.029
 N20 Intensity
 0.006

 (lb/MWhr)
 (lb/MWhr)
 (lb/MWhr)
 (lb/MWhr)

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Demo: 10 days, Grading: 8 days, Construction 230 days, Paving: 18 days

Off-road Equipment - Demo: 1 concrete saw, 1 excavator, 1 dozer

Off-road Equipment - Grading: 1 excavator, 1 grader, 1 dozer, 3 loader/backhoes

Off-road Equipment - Construction: 1 crane, 3 forklifts, 1 gen set, 3 loader/backhoes, 1 welder

Construction Off-road Equipment Mitigation - dpf filters for excavator, dozer, grader and loader/backhoes, crane

Area Mitigation - natural gas hearths

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Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstructionPhase	NumDays	18.00	30.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	PhaseEndDate	1/26/2016	2/16/2016
tblConstructionPhase	PhaseStartDate	1/15/2016	2/5/2016
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblProjectCharacteristics	OperationalYear	2014	2017

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year					ton	s/yr							MT	/yr		
2016	0.4179	3.5326	2.3490	3.3700e- 003	0.0320	0.2393	0.2713	0.0150	0.2247	0.2397	0.0000	303.6952	303.6952	0.0744	0.0000	305.2577
2017	0.3616	0.2115	0.1681	2.6000e- 004	1.8100e- 003	0.0135	0.0153	4.8000e- 004	0.0126	0.0131	0.0000	23.1209	23.1209	5.6400e- 003	0.0000	23.2393
Total	0.7795	3.7441	2.5170	3.6300e- 003	0.0338	0.2528	0.2866	0.0155	0.2374	0.2529	0.0000	326.8161	326.8161	0.0800	0.0000	328.4969

Mitigated Construction

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year					ton	s/yr							MT	/yr		
2016	0.4179	3.5326	2.3490	3.3700e- 003	0.0160	0.0842	0.1001	6.8100e- 003	0.0819	0.0887	0.0000	303.6949	303.6949	0.0744	0.0000	305.2573
2017	0.3616	0.2115	0.1681	2.6000e- 004	1.8100e- 003	0.0106	0.0124	4.8000e- 004	9.9600e- 003	0.0104	0.0000	23.1208	23.1208	5.6400e- 003	0.0000	23.2393
Total	0.7795	3.7441	2.5170	3.6300e- 003	0.0178	0.0947	0.1125	7.2900e- 003	0.0919	0.0992	0.0000	326.8157	326.8157	0.0800	0.0000	328.4966

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	47.31	62.54	60.75	52.97	61.28	60.78	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							MT	7/yr		
Area	0.1989	2.4600e- 003	0.2066	1.2000e- 004		0.0174	0.0174		0.0174	0.0174	1.7596	0.6108	2.3704	3.7200e- 003	1.0000e- 004	2.4784
Energy	2.2800e- 003	0.0195	8.3000e- 003	1.2000e- 004		1.5800e- 003	1.5800e- 003		1.5800e- 003	1.5800e- 003	0.0000	47.2852	47.2852	1.5500e- 003	6.5000e- 004	47.5178
Mobile	0.0687	0.1570	0.6894	1.3600e- 003	0.0950	2.0200e- 003	0.0970	0.0255	1.8600e- 003	0.0274	0.0000	105.0234	105.0234	4.3900e- 003	0.0000	105.1155
Waste		,				0.0000	0.0000		0.0000	0.0000	2.8987	0.0000	2.8987	0.1713	0.0000	6.4962
Water		,				0.0000	0.0000		0.0000	0.0000	0.2480	1.7326	1.9806	0.0256	6.2000e- 004	2.7088
Total	0.2699	0.1790	0.9043	1.6000e- 003	0.0950	0.0210	0.1160	0.0255	0.0208	0.0463	4.9064	154.6520	159.5584	0.2065	1.3700e- 003	164.3167

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2.2 Overall Operational

Mitigated Operational

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							МТ	⁻ /yr		
Area	0.1210	1.0500e- 003	0.0900	0.0000		5.5000e- 004	5.5000e- 004		5.5000e- 004	5.5000e- 004	0.0000	1.0337	1.0337	1.6000e- 004	2.0000e- 005	1.0422
Energy	2.2800e- 003	0.0195	8.3000e- 003	1.2000e- 004		1.5800e- 003	1.5800e- 003		1.5800e- 003	1.5800e- 003	0.0000	47.2852	47.2852	1.5500e- 003	6.5000e- 004	47.5178
Mobile	0.0687	0.1570	0.6894	1.3600e- 003	0.0950	2.0200e- 003	0.0970	0.0255	1.8600e- 003	0.0274	0.0000	105.0234	105.0234	4.3900e- 003	0.0000	105.1155
Waste			1 1 1			0.0000	0.0000		0.0000	0.0000	2.8987	0.0000	2.8987	0.1713	0.0000	6.4962
Water			1 1			0.0000	0.0000		0.0000	0.0000	0.2480	1.7326	1.9806	0.0256	6.2000e- 004	2.7084
Total	0.1921	0.1776	0.7877	1.4800e- 003	0.0950	4.1500e- 003	0.0991	0.0255	3.9900e- 003	0.0295	3.1468	155.0749	158.2216	0.2030	1.2900e- 003	162.8800

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	28.85	0.79	12.89	7.50	0.00	80.24	14.53	0.00	80.85	36.37	35.86	-0.27	0.84	1.72	5.84	0.87

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2016	1/14/2016	5	10	
2	Grading	Grading	2/5/2016	2/16/2016	5	8	
3	Building Construction	Building Construction	2/17/2016	1/3/2017	5	230	
4	Paving	Paving	1/4/2017	1/27/2017	5	18	
5	Architectural Coating	Architectural Coating	1/28/2017	3/10/2017	5	30	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

Acres of Paving: 0

Residential Indoor: 43,740; Residential Outdoor: 14,580; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Date: 11/3/2015 1:20 PM

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	1	8.00	162	0.38
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Grading	Excavators	1	8.00	162	0.38
Paving	Pavers	1	8.00	125	0.42
Paving	Rollers	2	6.00	80	0.38
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	8.00	174	0.41
Paving	Paving Equipment	2	6.00	130	0.36
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	3	8.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	4.00	1.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

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3.1 Mitigation Measures Construction

Use DPF for Construction Equipment
Water Exposed Area
Clean Paved Roads

3.2 Demolition - 2016 <u>Unmitigated Construction On-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							MT	/yr		
	0.0114	0.1146	0.0884	1.0000e- 004		6.0500e- 003	6.0500e- 003		5.7100e- 003	5.7100e- 003	0.0000	9.3713	9.3713	2.2800e- 003	0.0000	9.4191
Total	0.0114	0.1146	0.0884	1.0000e- 004		6.0500e- 003	6.0500e- 003		5.7100e- 003	5.7100e- 003	0.0000	9.3713	9.3713	2.2800e- 003	0.0000	9.4191

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3.2 Demolition - 2016 <u>Unmitigated Construction Off-Site</u>

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							МТ	/уг		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e- 004	2.2000e- 004	2.1300e- 003	0.0000	3.6000e- 004	0.0000	3.7000e- 004	1.0000e- 004	0.0000	1.0000e- 004	0.0000	0.3293	0.3293	2.0000e- 005	0.0000	0.3297
Total	1.5000e- 004	2.2000e- 004	2.1300e- 003	0.0000	3.6000e- 004	0.0000	3.7000e- 004	1.0000e- 004	0.0000	1.0000e- 004	0.0000	0.3293	0.3293	2.0000e- 005	0.0000	0.3297

Mitigated Construction On-Site

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							МТ	/yr		
	0.0114	0.1146	0.0884	1.0000e- 004		2.3800e- 003	2.3800e- 003	 	2.3300e- 003	2.3300e- 003	0.0000	9.3713	9.3713	2.2800e- 003	0.0000	9.4191
Total	0.0114	0.1146	0.0884	1.0000e- 004		2.3800e- 003	2.3800e- 003		2.3300e- 003	2.3300e- 003	0.0000	9.3713	9.3713	2.2800e- 003	0.0000	9.4191

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3.2 **Demolition - 2016**

Mitigated Construction Off-Site

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							МТ	/уг		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e- 004	2.2000e- 004	2.1300e- 003	0.0000	3.6000e- 004	0.0000	3.7000e- 004	1.0000e- 004	0.0000	1.0000e- 004	0.0000	0.3293	0.3293	2.0000e- 005	0.0000	0.3297
Total	1.5000e- 004	2.2000e- 004	2.1300e- 003	0.0000	3.6000e- 004	0.0000	3.7000e- 004	1.0000e- 004	0.0000	1.0000e- 004	0.0000	0.3293	0.3293	2.0000e- 005	0.0000	0.3297

3.3 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							МТ	/yr		
Fugitive Dust					0.0262	0.0000	0.0262	0.0135	0.0000	0.0135	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0147	0.1538	0.1043	1.2000e- 004		8.7900e- 003	8.7900e- 003		8.0900e- 003	8.0900e- 003	0.0000	11.2266	11.2266	3.3900e- 003	0.0000	11.2977
Total	0.0147	0.1538	0.1043	1.2000e- 004	0.0262	8.7900e- 003	0.0350	0.0135	8.0900e- 003	0.0216	0.0000	11.2266	11.2266	3.3900e- 003	0.0000	11.2977

3.3 Grading - 2016
Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							MT	/yr		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e- 004	3.3000e- 004	3.1900e- 003	1.0000e- 005	5.4000e- 004	0.0000	5.5000e- 004	1.4000e- 004	0.0000	1.5000e- 004	0.0000	0.4939	0.4939	3.0000e- 005	0.0000	0.4945
Total	2.3000e- 004	3.3000e- 004	3.1900e- 003	1.0000e- 005	5.4000e- 004	0.0000	5.5000e- 004	1.4000e- 004	0.0000	1.5000e- 004	0.0000	0.4939	0.4939	3.0000e- 005	0.0000	0.4945

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							MT	/yr		
Fugitive Dust					0.0102	0.0000	0.0102	5.2500e- 003	0.0000	5.2500e- 003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0147	0.1538	0.1043	1.2000e- 004		1.3200e- 003	1.3200e- 003		1.2100e- 003	1.2100e- 003	0.0000	11.2265	11.2265	3.3900e- 003	0.0000	11.2977
Total	0.0147	0.1538	0.1043	1.2000e- 004	0.0102	1.3200e- 003	0.0115	5.2500e- 003	1.2100e- 003	6.4600e- 003	0.0000	11.2265	11.2265	3.3900e- 003	0.0000	11.2977

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3.3 Grading - 2016

Mitigated Construction Off-Site

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							МТ	/уг		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e- 004	3.3000e- 004	3.1900e- 003	1.0000e- 005	5.4000e- 004	0.0000	5.5000e- 004	1.4000e- 004	0.0000	1.5000e- 004	0.0000	0.4939	0.4939	3.0000e- 005	0.0000	0.4945
Total	2.3000e- 004	3.3000e- 004	3.1900e- 003	1.0000e- 005	5.4000e- 004	0.0000	5.5000e- 004	1.4000e- 004	0.0000	1.5000e- 004	0.0000	0.4939	0.4939	3.0000e- 005	0.0000	0.4945

3.4 Building Construction - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							MT	/yr		
Off-Road	0.3883	3.2497	2.1098	3.0600e- 003		0.2243	0.2243		0.2107	0.2107	0.0000	276.0551	276.0551	0.0685	0.0000	277.4929
Total	0.3883	3.2497	2.1098	3.0600e- 003		0.2243	0.2243		0.2107	0.2107	0.0000	276.0551	276.0551	0.0685	0.0000	277.4929

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3.4 Building Construction - 2016 <u>Unmitigated Construction Off-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							MT	⁻ /yr		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.4500e- 003	0.0114	0.0169	3.0000e- 005	7.3000e- 004	1.7000e- 004	9.0000e- 004	2.1000e- 004	1.6000e- 004	3.7000e- 004	0.0000	2.4654	2.4654	2.0000e- 005	0.0000	2.4658
Worker	1.7300e- 003	2.5100e- 003	0.0243	5.0000e- 005	4.1400e- 003	3.0000e- 005	4.1700e- 003	1.1000e- 003	3.0000e- 005	1.1300e- 003	0.0000	3.7538	3.7538	2.1000e- 004	0.0000	3.7581
Total	3.1800e- 003	0.0139	0.0411	8.0000e- 005	4.8700e- 003	2.0000e- 004	5.0700e- 003	1.3100e- 003	1.9000e- 004	1.5000e- 003	0.0000	6.2191	6.2191	2.3000e- 004	0.0000	6.2239

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							MT	/yr		
Off-Road	0.3883	3.2497	2.1098	3.0600e- 003		0.0802	0.0802	 	0.0782	0.0782	0.0000	276.0548	276.0548	0.0685	0.0000	277.4926
Total	0.3883	3.2497	2.1098	3.0600e- 003		0.0802	0.0802		0.0782	0.0782	0.0000	276.0548	276.0548	0.0685	0.0000	277.4926

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3.4 Building Construction - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							МТ	/уг		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.4500e- 003	0.0114	0.0169	3.0000e- 005	7.3000e- 004	1.7000e- 004	9.0000e- 004	2.1000e- 004	1.6000e- 004	3.7000e- 004	0.0000	2.4654	2.4654	2.0000e- 005	0.0000	2.4658
Worker	1.7300e- 003	2.5100e- 003	0.0243	5.0000e- 005	4.1400e- 003	3.0000e- 005	4.1700e- 003	1.1000e- 003	3.0000e- 005	1.1300e- 003	0.0000	3.7538	3.7538	2.1000e- 004	0.0000	3.7581
Total	3.1800e- 003	0.0139	0.0411	8.0000e- 005	4.8700e- 003	2.0000e- 004	5.0700e- 003	1.3100e- 003	1.9000e- 004	1.5000e- 003	0.0000	6.2191	6.2191	2.3000e- 004	0.0000	6.2239

3.4 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							МТ	-/yr		
	3.1000e- 003	0.0264	0.0181	3.0000e- 005		1.7800e- 003	1.7800e- 003		1.6700e- 003	1.6700e- 003	0.0000	2.3948	2.3948	5.9000e- 004	0.0000	2.4072
Total	3.1000e- 003	0.0264	0.0181	3.0000e- 005		1.7800e- 003	1.7800e- 003		1.6700e- 003	1.6700e- 003	0.0000	2.3948	2.3948	5.9000e- 004	0.0000	2.4072

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3.4 Building Construction - 2017 Unmitigated Construction Off-Site

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							MT	⁻ /yr		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e- 005	9.0000e- 005	1.4000e- 004	0.0000	1.0000e- 005	0.0000	1.0000e- 005	0.0000	0.0000	0.0000	0.0000	0.0213	0.0213	0.0000	0.0000	0.0213
Worker	1.0000e- 005	2.0000e- 005	1.9000e- 004	0.0000	4.0000e- 005	0.0000	4.0000e- 005	1.0000e- 005	0.0000	1.0000e- 005	0.0000	0.0317	0.0317	0.0000	0.0000	0.0317
Total	2.0000e- 005	1.1000e- 004	3.3000e- 004	0.0000	5.0000e- 005	0.0000	5.0000e- 005	1.0000e- 005	0.0000	1.0000e- 005	0.0000	0.0529	0.0529	0.0000	0.0000	0.0530

Mitigated Construction On-Site

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							MT	/yr		
	3.1000e- 003	0.0264	0.0181	3.0000e- 005		6.3000e- 004	6.3000e- 004	 	6.1000e- 004	6.1000e- 004	0.0000	2.3948	2.3948	5.9000e- 004	0.0000	2.4072
Total	3.1000e- 003	0.0264	0.0181	3.0000e- 005		6.3000e- 004	6.3000e- 004		6.1000e- 004	6.1000e- 004	0.0000	2.3948	2.3948	5.9000e- 004	0.0000	2.4072

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3.4 Building Construction - 2017

Mitigated Construction Off-Site

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							МТ	/yr		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e- 005	9.0000e- 005	1.4000e- 004	0.0000	1.0000e- 005	0.0000	1.0000e- 005	0.0000	0.0000	0.0000	0.0000	0.0213	0.0213	0.0000	0.0000	0.0213
Worker	1.0000e- 005	2.0000e- 005	1.9000e- 004	0.0000	4.0000e- 005	0.0000	4.0000e- 005	1.0000e- 005	0.0000	1.0000e- 005	0.0000	0.0317	0.0317	0.0000	0.0000	0.0317
Total	2.0000e- 005	1.1000e- 004	3.3000e- 004	0.0000	5.0000e- 005	0.0000	5.0000e- 005	1.0000e- 005	0.0000	1.0000e- 005	0.0000	0.0529	0.0529	0.0000	0.0000	0.0530

3.5 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							MT	/yr		
Off-Road	0.0149	0.1512	0.1124	1.7000e- 004		9.0500e- 003	9.0500e- 003		8.3400e- 003	8.3400e- 003	0.0000	15.2992	15.2992	4.5600e- 003	0.0000	15.3950
Paving	0.0000	 				0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0149	0.1512	0.1124	1.7000e- 004		9.0500e- 003	9.0500e- 003		8.3400e- 003	8.3400e- 003	0.0000	15.2992	15.2992	4.5600e- 003	0.0000	15.3950

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3.5 Paving - 2017

<u>Unmitigated Construction Off-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							MT	/yr		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.1000e- 004	8.9000e- 004	8.5200e- 003	2.0000e- 005	1.6300e- 003	1.0000e- 005	1.6500e- 003	4.3000e- 004	1.0000e- 005	4.5000e- 004	0.0000	1.4253	1.4253	7.0000e- 005	0.0000	1.4269
Total	6.1000e- 004	8.9000e- 004	8.5200e- 003	2.0000e- 005	1.6300e- 003	1.0000e- 005	1.6500e- 003	4.3000e- 004	1.0000e- 005	4.5000e- 004	0.0000	1.4253	1.4253	7.0000e- 005	0.0000	1.4269

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							MT	/yr		
Off-Road	0.0149	0.1512	0.1124	1.7000e- 004		7.3000e- 003	7.3000e- 003		6.7300e- 003	6.7300e- 003	0.0000	15.2991	15.2991	4.5600e- 003	0.0000	15.3950
Paving	0.0000					0.0000	0.0000	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0149	0.1512	0.1124	1.7000e- 004		7.3000e- 003	7.3000e- 003		6.7300e- 003	6.7300e- 003	0.0000	15.2991	15.2991	4.5600e- 003	0.0000	15.3950

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3.5 Paving - 2017

<u>Mitigated Construction Off-Site</u>

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							МТ	/yr		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	6.1000e- 004	8.9000e- 004	8.5200e- 003	2.0000e- 005	1.6300e- 003	1.0000e- 005	1.6500e- 003	4.3000e- 004	1.0000e- 005	4.5000e- 004	0.0000	1.4253	1.4253	7.0000e- 005	0.0000	1.4269
Total	6.1000e- 004	8.9000e- 004	8.5200e- 003	2.0000e- 005	1.6300e- 003	1.0000e- 005	1.6500e- 003	4.3000e- 004	1.0000e- 005	4.5000e- 004	0.0000	1.4253	1.4253	7.0000e- 005	0.0000	1.4269

3.6 Architectural Coating - 2017 <u>Unmitigated Construction On-Site</u>

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							MT	/yr		
Archit. Coating	0.3379					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.9800e- 003	0.0328	0.0280	4.0000e- 005		2.6000e- 003	2.6000e- 003		2.6000e- 003	2.6000e- 003	0.0000	3.8299	3.8299	4.0000e- 004	0.0000	3.8384
Total	0.3429	0.0328	0.0280	4.0000e- 005		2.6000e- 003	2.6000e- 003		2.6000e- 003	2.6000e- 003	0.0000	3.8299	3.8299	4.0000e- 004	0.0000	3.8384

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3.6 Architectural Coating - 2017 Unmitigated Construction Off-Site

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							МТ	/yr		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e- 005	7.0000e- 005	7.1000e- 004	0.0000	1.4000e- 004	0.0000	1.4000e- 004	4.0000e- 005	0.0000	4.0000e- 005	0.0000	0.1188	0.1188	1.0000e- 005	0.0000	0.1189
Total	5.0000e- 005	7.0000e- 005	7.1000e- 004	0.0000	1.4000e- 004	0.0000	1.4000e- 004	4.0000e- 005	0.0000	4.0000e- 005	0.0000	0.1188	0.1188	1.0000e- 005	0.0000	0.1189

Mitigated Construction On-Site

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							MT	/yr		
Archit. Coating	0.3379					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.9800e- 003	0.0328	0.0280	4.0000e- 005		2.6000e- 003	2.6000e- 003		2.6000e- 003	2.6000e- 003	0.0000	3.8299	3.8299	4.0000e- 004	0.0000	3.8384
Total	0.3429	0.0328	0.0280	4.0000e- 005		2.6000e- 003	2.6000e- 003		2.6000e- 003	2.6000e- 003	0.0000	3.8299	3.8299	4.0000e- 004	0.0000	3.8384

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3.6 Architectural Coating - 2017 Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							МТ	/yr		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e- 005	7.0000e- 005	7.1000e- 004	0.0000	1.4000e- 004	0.0000	1.4000e- 004	4.0000e- 005	0.0000	4.0000e- 005	0.0000	0.1188	0.1188	1.0000e- 005	0.0000	0.1189
Total	5.0000e- 005	7.0000e- 005	7.1000e- 004	0.0000	1.4000e- 004	0.0000	1.4000e- 004	4.0000e- 005	0.0000	4.0000e- 005	0.0000	0.1188	0.1188	1.0000e- 005	0.0000	0.1189

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							MT	/yr		
Mitigated	0.0687	0.1570	0.6894	1.3600e- 003	0.0950	2.0200e- 003	0.0970	0.0255	1.8600e- 003	0.0274	0.0000	105.0234	105.0234	4.3900e- 003	0.0000	105.1155
Unmitigated	0.0687	0.1570	0.6894	1.3600e- 003	0.0950	2.0200e- 003	0.0970	0.0255	1.8600e- 003	0.0274	0.0000	105.0234	105.0234	4.3900e- 003	0.0000	105.1155

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4.2 Trip Summary Information

	Avei	rage Daily Trip Ra	ite	Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	114.84	120.96	105.24	255,255	255,255
Total	114.84	120.96	105.24	255,255	255,255

4.3 Trip Type Information

		Miles			Trip %			Trip Purpos	e %
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.546114	0.062902	0.174648	0.122995	0.034055	0.004856	0.015640	0.024397	0.002087	0.003279	0.006673	0.000688	0.001667

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr												МТ	/yr		
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	24.6912	24.6912	1.1200e- 003	2.3000e- 004	24.7863
Electricity Unmitigated			,			0.0000	0.0000	,	0.0000	0.0000	0.0000	24.6912	24.6912	1.1200e- 003	2.3000e- 004	24.7863
Mitigated	2.2800e- 003	0.0195	8.3000e- 003	1.2000e- 004		1.5800e- 003	1.5800e- 003	,	1.5800e- 003	1.5800e- 003	0.0000	22.5940	22.5940	4.3000e- 004	4.1000e- 004	22.7315
	2.2800e- 003	0.0195	8.3000e- 003	1.2000e- 004		1.5800e- 003	1.5800e- 003	 	1.5800e- 003	1.5800e- 003	0.0000	22.5940	22.5940	4.3000e- 004	4.1000e- 004	22.7315

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGa s Use	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr					ton	s/yr							MT	/yr		
Single Family Housing	423396	2.2800e- 003	0.0195	8.3000e- 003	1.2000e- 004		1.5800e- 003	1.5800e- 003		1.5800e- 003	1.5800e- 003	0.0000	22.5940	22.5940	4.3000e- 004	4.1000e- 004	22.7315
Total		2.2800e- 003	0.0195	8.3000e- 003	1.2000e- 004		1.5800e- 003	1.5800e- 003		1.5800e- 003	1.5800e- 003	0.0000	22.5940	22.5940	4.3000e- 004	4.1000e- 004	22.7315

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5.2 Energy by Land Use - NaturalGas Mitigated

	NaturalGa s Use	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr		tons/yr											MT	/yr		
Single Family Housing	423396	2.2800e- 003	0.0195	8.3000e- 003	1.2000e- 004		1.5800e- 003	1.5800e- 003		1.5800e- 003	1.5800e- 003	0.0000	22.5940	22.5940	4.3000e- 004	4.1000e- 004	22.7315
Total		2.2800e- 003	0.0195	8.3000e- 003	1.2000e- 004		1.5800e- 003	1.5800e- 003		1.5800e- 003	1.5800e- 003	0.0000	22.5940	22.5940	4.3000e- 004	4.1000e- 004	22.7315

5.3 Energy by Land Use - Electricity Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr		MT	/yr	
Single Family Housing	84875.3	24.6912	1.1200e- 003	2.3000e- 004	24.7863
Total		24.6912	1.1200e- 003	2.3000e- 004	24.7863

5.3 Energy by Land Use - Electricity Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr		МТ	⁻/yr	
Single Family Housing		24.6912	1.1200e- 003	2.3000e- 004	24.7863
Total		24.6912	1.1200e- 003	2.3000e- 004	24.7863

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							MT	/yr		
Mitigated	0.1210	1.0500e- 003	0.0900	0.0000		5.5000e- 004	5.5000e- 004		5.5000e- 004	5.5000e- 004	0.0000	1.0337	1.0337	1.6000e- 004	2.0000e- 005	1.0422
Unmitigated	0.1989	2.4600e- 003	0.2066	1.2000e- 004		0.0174	0.0174	 	0.0174	0.0174	1.7596	0.6108	2.3704	3.7200e- 003	1.0000e- 004	2.4784

6.2 Area by SubCategory Unmitigated

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory		tons/yr											MT	⁷ /yr		
Architectural Coating	0.0338					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0844					0.0000	0.0000	 	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0780	1.4100e- 003	0.1166	1.1000e- 004		0.0169	0.0169	 	0.0169	0.0169	1.7596	0.4652	2.2249	3.5700e- 003	1.0000e- 004	2.3298
Landscaping	2.8000e- 003	1.0500e- 003	0.0900	0.0000		4.9000e- 004	4.9000e- 004	! ! ! !	4.9000e- 004	4.9000e- 004	0.0000	0.1456	0.1456	1.5000e- 004	0.0000	0.1486
Total	0.1989	2.4600e- 003	0.2066	1.1000e- 004		0.0174	0.0174		0.0174	0.0174	1.7596	0.6108	2.3704	3.7200e- 003	1.0000e- 004	2.4784

6.2 Area by SubCategory

Mitigated

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory		tons/yr											MT	/уг		
	0.0338					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0844	 	 			0.0000	0.0000	 	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	9.0000e- 005	0.0000	0.0000	0.0000		6.0000e- 005	6.0000e- 005	 	6.0000e- 005	6.0000e- 005	0.0000	0.8882	0.8882	2.0000e- 005	2.0000e- 005	0.8936
Landscaping	2.8000e- 003	1.0500e- 003	0.0900	0.0000		4.9000e- 004	4.9000e- 004		4.9000e- 004	4.9000e- 004	0.0000	0.1456	0.1456	1.5000e- 004	0.0000	0.1486
Total	0.1210	1.0500e- 003	0.0900	0.0000		5.5000e- 004	5.5000e- 004		5.5000e- 004	5.5000e- 004	0.0000	1.0337	1.0337	1.7000e- 004	2.0000e- 005	1.0422

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category		МТ	√yr	
Willigatou	1.9806	0.0256	6.2000e- 004	2.7084
Crimingatod	1.9806	0.0256	6.2000e- 004	2.7088

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7.2 Water by Land Use <u>Unmitigated</u>

	Indoor/Out door Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal		МТ	√yr	
Single Family Housing	0.781848 / 0.492904	1.9806	0.0256	6.2000e- 004	2.7088
Total		1.9806	0.0256	6.2000e- 004	2.7088

Mitigated

	Indoor/Out door Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal		MT	-/yr	
	0.781848 / 0.492904		0.0256	6.2000e- 004	2.7084
Total		1.9806	0.0256	6.2000e- 004	2.7084

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e							
		MT/yr									
Willingutou	2.8987	0.1713	0.0000	6.4962							
Unmitigated	2.8987	0.1713	0.0000	6.4962							

8.2 Waste by Land Use <u>Unmitigated</u>

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons		MT	-/yr	
Single Family Housing	14.28	2.8987	0.1713	0.0000	6.4962
Total		2.8987	0.1713	0.0000	6.4962

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8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons		MT	/yr	
Single Family Housing	14.28	2.8987	0.1713	0.0000	6.4962
Total		2.8987	0.1713	0.0000	6.4962

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

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Busk Project

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San Francisco Bay Area Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	12.00	Dwelling Unit	3.90	21,600.00	34

1.2 Other Project Characteristics

UrbanizationUrbanWind Speed (m/s)2.2Precipitation Freq (Days)64

Climate Zone 4 Operational Year 2017

Utility Company Pacific Gas & Electric Company

 CO2 Intensity
 641.35
 CH4 Intensity
 0.029
 N20 Intensity
 0.006

 (lb/MWhr)
 (lb/MWhr)
 (lb/MWhr)
 (lb/MWhr)

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Demo: 10 days, Grading: 8 days, Construction 230 days, Paving: 18 days

Off-road Equipment - Demo: 1 concrete saw, 1 excavator, 1 dozer

Off-road Equipment - Grading: 1 excavator, 1 grader, 1 dozer, 3 loader/backhoes

Off-road Equipment - Construction: 1 crane, 3 forklifts, 1 gen set, 3 loader/backhoes, 1 welder

Construction Off-road Equipment Mitigation - dpf filters for excavator, dozer, grader and loader/backhoes, crane

Area Mitigation - natural gas hearths

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Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstructionPhase	NumDays	18.00	30.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	PhaseEndDate	1/26/2016	2/16/2016
tblConstructionPhase	PhaseStartDate	1/15/2016	2/5/2016
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblProjectCharacteristics	OperationalYear	2014	2017

2.0 Emissions Summary

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2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year					lb/d	day							lb/c	lay		
2016	3.7278	38.5195	26.9301	0.0315	6.6938	2.1995	8.8933	3.4050	2.0236	5.4286	0.0000	3,239.997 3	3,239.997 3	0.9407	0.0000	3,259.751 9
2017	22.8620	26.5099	18.4392	0.0275	0.1886	1.7828	1.8272	0.0500	1.6744	1.6863	0.0000	2,700.825 5	2,700.825 5	0.6517	0.0000	2,714.511 3
Total	26.5898	65.0294	45.3693	0.0590	6.8824	3.9823	10.7205	3.4550	3.6980	7.1149	0.0000	5,940.822 8	5,940.822 8	1.5924	0.0000	5,974.263 2

Mitigated Construction

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	ar Ib/day									lb/day						
2016	3.7278	38.5195	26.9301	0.0315	2.6969	0.7056	3.0278	1.3508	0.6876	1.6553	0.0000	3,239.997 3	3,239.997 3	0.9407	0.0000	3,259.751 9
2017	22.8620	26.5099	18.4392	0.0275	0.1886	0.8124	1.0010	0.0500	0.7492	0.7992	0.0000	2,700.825 5	2,700.825 5	0.6517	0.0000	2,714.511 3
Total	26.5898	65.0294	45.3693	0.0590	2.8855	1.5180	4.0288	1.4009	1.4368	2.4545	0.0000	5,940.822 8	5,940.822 8	1.5924	0.0000	5,974.263 2

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	58.07	61.88	62.42	59.45	61.15	65.50	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day									lb/day						
Area	24.5344	0.3224	29.6350	8.7300e- 003		4.0075	4.0075		4.0074	4.0074	413.6548	164.8415	578.4963	0.3043	0.0338	595.3756
Energy	0.0125	0.1069	0.0455	6.8000e- 004		8.6400e- 003	8.6400e- 003	1 	8.6400e- 003	8.6400e- 003		136.4691	136.4691	2.6200e- 003	2.5000e- 003	137.2997
Mobile	0.4093	0.8563	3.8486	8.3900e- 003	0.5735	0.0117	0.5852	0.1534	0.0108	0.1642		711.1347	711.1347	0.0281		711.7253
Total	24.9561	1.2856	33.5291	0.0178	0.5735	4.0279	4.6013	0.1534	4.0268	4.1802	413.6548	1,012.445 3	1,426.100 2	0.3350	0.0363	1,444.400 5

Mitigated Operational

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day									lb/day						
Area	0.7071	0.0117	1.0015	5.0000e- 005		0.0252	0.0252		0.0249	0.0249	0.0000	313.0768	313.0768	7.7600e- 003	5.7100e- 003	315.0088
Energy	0.0125	0.1069	0.0455	6.8000e- 004		8.6400e- 003	8.6400e- 003		8.6400e- 003	8.6400e- 003		136.4691	136.4691	2.6200e- 003	2.5000e- 003	137.2997
Mobile	0.4093	0.8563	3.8486	8.3900e- 003	0.5735	0.0117	0.5852	0.1534	0.0108	0.1642		711.1347	711.1347	0.0281		711.7253
Total	1.1288	0.9749	4.8956	9.1200e- 003	0.5735	0.0455	0.6190	0.1534	0.0444	0.1978	0.0000	1,160.680 6	1,160.680 6	0.0385	8.2100e- 003	1,164.033 8

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	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	95.48	24.17	85.40	48.76	0.00	98.87	86.55	0.00	98.90	95.27	100.00	-14.64	18.61	88.51	77.41	19.41

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2016	1/14/2016	5	10	
2	Grading	Grading	2/5/2016	2/16/2016	5	8	
3	Building Construction	Building Construction	2/17/2016	1/3/2017	5	230	
4	Paving	Paving	1/4/2017	1/27/2017	5	18	
5	Architectural Coating	Architectural Coating	1/28/2017	3/10/2017	5	30	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

Acres of Paving: 0

Residential Indoor: 43,740; Residential Outdoor: 14,580; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

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Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	2	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	1	8.00	162	0.38
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Grading	Excavators	1	8.00	162	0.38
Paving	Pavers	1	8.00	125	0.42
Paving	Rollers	2	6.00	80	0.38
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	8.00	174	0.41
Paving	Paving Equipment	2	6.00	130	0.36
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	3	8.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	4.00	1.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	12.40	7.30	20.00	LD_Mix	HDT_Mix	HHDT

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3.1 Mitigation Measures Construction

Use DPF for Construction Equipment
Water Exposed Area
Clean Paved Roads

3.2 Demolition - 2016 <u>Unmitigated Construction On-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day								lb/day							
Off-Road	2.2730	22.9235	17.6886	0.0204		1.2107	1.2107		1.1416	1.1416		2,066.015 8	2,066.015 8	0.5018		2,076.553 1
Total	2.2730	22.9235	17.6886	0.0204		1.2107	1.2107		1.1416	1.1416		2,066.015 8	2,066.015 8	0.5018		2,076.553 1

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3.2 Demolition - 2016 <u>Unmitigated Construction Off-Site</u>

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/	day							lb/d	day		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0325	0.0389	0.4541	9.3000e- 004	0.0754	6.1000e- 004	0.0761	0.0200	5.6000e- 004	0.0206		77.9778	77.9778	4.0000e- 003		78.0618
Total	0.0325	0.0389	0.4541	9.3000e- 004	0.0754	6.1000e- 004	0.0761	0.0200	5.6000e- 004	0.0206		77.9778	77.9778	4.0000e- 003		78.0618

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/d	day							lb/d	lay		
Off-Road	2.2730	22.9235	17.6886	0.0204		0.4768	0.4768		0.4664	0.4664	0.0000	2,066.015 8	2,066.015 8	0.5018		2,076.553 1
Total	2.2730	22.9235	17.6886	0.0204		0.4768	0.4768		0.4664	0.4664	0.0000	2,066.015 8	2,066.015 8	0.5018		2,076.553 1

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3.2 **Demolition - 2016**

Mitigated Construction Off-Site

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/	day							lb/d	day		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0325	0.0389	0.4541	9.3000e- 004	0.0754	6.1000e- 004	0.0761	0.0200	5.6000e- 004	0.0206		77.9778	77.9778	4.0000e- 003		78.0618
Total	0.0325	0.0389	0.4541	9.3000e- 004	0.0754	6.1000e- 004	0.0761	0.0200	5.6000e- 004	0.0206		77.9778	77.9778	4.0000e- 003		78.0618

3.3 Grading - 2016

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/d	day							lb/d	day		
Fugitive Dust	 				6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	3.6669	38.4466	26.0787	0.0298		2.1984	2.1984		2.0225	2.0225		3,093.788 9	3,093.788 9	0.9332	i i	3,113.386 0
Total	3.6669	38.4466	26.0787	0.0298	6.5523	2.1984	8.7507	3.3675	2.0225	5.3900		3,093.788 9	3,093.788 9	0.9332		3,113.386 0

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3.3 Grading - 2016
Unmitigated Construction Off-Site

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/	day							lb/d	day		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0609	0.0729	0.8514	1.7400e- 003	0.1415	1.1400e- 003	0.1426	0.0375	1.0400e- 003	0.0386		146.2084	146.2084	7.5000e- 003		146.3659
Total	0.0609	0.0729	0.8514	1.7400e- 003	0.1415	1.1400e- 003	0.1426	0.0375	1.0400e- 003	0.0386		146.2084	146.2084	7.5000e- 003		146.3659

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/d	day							lb/d	day		
Fugitive Dust					2.5554	0.0000	2.5554	1.3133	0.0000	1.3133			0.0000			0.0000
Off-Road	3.6669	38.4466	26.0787	0.0298		0.3298	0.3298] 	0.3034	0.3034	0.0000	3,093.788 9	3,093.788 9	0.9332	 	3,113.386 0
Total	3.6669	38.4466	26.0787	0.0298	2.5554	0.3298	2.8852	1.3133	0.3034	1.6167	0.0000	3,093.788 9	3,093.788 9	0.9332		3,113.386 0

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3.3 Grading - 2016

Mitigated Construction Off-Site

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/d	day							lb/c	day		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0609	0.0729	0.8514	1.7400e- 003	0.1415	1.1400e- 003	0.1426	0.0375	1.0400e- 003	0.0386		146.2084	146.2084	7.5000e- 003		146.3659
Total	0.0609	0.0729	0.8514	1.7400e- 003	0.1415	1.1400e- 003	0.1426	0.0375	1.0400e- 003	0.0386		146.2084	146.2084	7.5000e- 003		146.3659

3.4 Building Construction - 2016

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/d	day							lb/d	day		
Off-Road	3.4062	28.5063	18.5066	0.0268		1.9674	1.9674		1.8485	1.8485		2,669.286 4	2,669.286 4	0.6620		2,683.189 0
Total	3.4062	28.5063	18.5066	0.0268		1.9674	1.9674		1.8485	1.8485		2,669.286 4	2,669.286 4	0.6620		2,683.189 0

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3.4 Building Construction - 2016 <u>Unmitigated Construction Off-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/o	day							lb/d	day		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0113	0.0969	0.1156	2.4000e- 004	6.6500e- 003	1.4900e- 003	8.1400e- 003	1.9000e- 003	1.3700e- 003	3.2700e- 003		23.9153	23.9153	1.9000e- 004		23.9193
Worker	0.0162	0.0194	0.2270	4.6000e- 004	0.0377	3.0000e- 004	0.0380	0.0100	2.8000e- 004	0.0103		38.9889	38.9889	2.0000e- 003		39.0309
Total	0.0275	0.1163	0.3427	7.0000e- 004	0.0444	1.7900e- 003	0.0462	0.0119	1.6500e- 003	0.0136		62.9042	62.9042	2.1900e- 003		62.9502

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/d	day							lb/c	lay		
Off-Road	3.4062	28.5063	18.5066	0.0268		0.7038	0.7038		0.6859	0.6859	0.0000	2,669.286 4	2,669.286 4	0.6620		2,683.189 0
Total	3.4062	28.5063	18.5066	0.0268		0.7038	0.7038		0.6859	0.6859	0.0000	2,669.286 4	2,669.286 4	0.6620		2,683.189 0

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3.4 Building Construction - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/d	day							lb/d	day		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0113	0.0969	0.1156	2.4000e- 004	6.6500e- 003	1.4900e- 003	8.1400e- 003	1.9000e- 003	1.3700e- 003	3.2700e- 003		23.9153	23.9153	1.9000e- 004	;	23.9193
Worker	0.0162	0.0194	0.2270	4.6000e- 004	0.0377	3.0000e- 004	0.0380	0.0100	2.8000e- 004	0.0103		38.9889	38.9889	2.0000e- 003		39.0309
Total	0.0275	0.1163	0.3427	7.0000e- 004	0.0444	1.7900e- 003	0.0462	0.0119	1.6500e- 003	0.0136		62.9042	62.9042	2.1900e- 003		62.9502

3.4 Building Construction - 2017

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/d	day							lb/c	lay		
Off-Road	3.1024	26.4057	18.1291	0.0268		1.7812	1.7812		1.6730	1.6730		2,639.805 3	2,639.805 3	0.6497		2,653.449 0
Total	3.1024	26.4057	18.1291	0.0268		1.7812	1.7812		1.6730	1.6730		2,639.805 3	2,639.805 3	0.6497		2,653.449 0

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3.4 Building Construction - 2017 Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/	day							lb/d	day		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0103	0.0869	0.1071	2.4000e- 004	6.6500e- 003	1.2900e- 003	7.9400e- 003	1.9000e- 003	1.1800e- 003	3.0800e- 003		23.5119	23.5119	1.8000e- 004		23.5157
Worker	0.0145	0.0174	0.2030	4.6000e- 004	0.0377	2.9000e- 004	0.0380	0.0100	2.7000e- 004	0.0103		37.5082	37.5082	1.8300e- 003		37.5466
Total	0.0248	0.1043	0.3101	7.0000e- 004	0.0444	1.5800e- 003	0.0460	0.0119	1.4500e- 003	0.0134		61.0202	61.0202	2.0100e- 003		61.0623

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/d	day							lb/d	day		
Off-Road	3.1024	26.4057	18.1291	0.0268		0.6311	0.6311		0.6149	0.6149	0.0000	2,639.805 3	2,639.805 3	0.6497		2,653.449 0
Total	3.1024	26.4057	18.1291	0.0268		0.6311	0.6311		0.6149	0.6149	0.0000	2,639.805 3	2,639.805 3	0.6497		2,653.449 0

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3.4 Building Construction - 2017

Mitigated Construction Off-Site

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/	day							lb/d	day		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0103	0.0869	0.1071	2.4000e- 004	6.6500e- 003	1.2900e- 003	7.9400e- 003	1.9000e- 003	1.1800e- 003	3.0800e- 003		23.5119	23.5119	1.8000e- 004		23.5157
Worker	0.0145	0.0174	0.2030	4.6000e- 004	0.0377	2.9000e- 004	0.0380	0.0100	2.7000e- 004	0.0103		37.5082	37.5082	1.8300e- 003		37.5466
Total	0.0248	0.1043	0.3101	7.0000e- 004	0.0444	1.5800e- 003	0.0460	0.0119	1.4500e- 003	0.0134		61.0202	61.0202	2.0100e- 003		61.0623

3.5 Paving - 2017

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/d	day							lb/c	day		
Off-Road	1.6554	16.8035	12.4837	0.0186		1.0056	1.0056		0.9269	0.9269		1,873.826 4	1,873.826 4	0.5588		1,885.560 9
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000		 	0.0000
Total	1.6554	16.8035	12.4837	0.0186		1.0056	1.0056		0.9269	0.9269		1,873.826 4	1,873.826 4	0.5588		1,885.560 9

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3.5 Paving - 2017

<u>Unmitigated Construction Off-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/d	day							lb/d	day		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0725	0.0870	1.0148	2.3200e- 003	0.1886	1.4400e- 003	0.1901	0.0500	1.3300e- 003	0.0514		187.5410	187.5410	9.1300e- 003		187.7328
Total	0.0725	0.0870	1.0148	2.3200e- 003	0.1886	1.4400e- 003	0.1901	0.0500	1.3300e- 003	0.0514		187.5410	187.5410	9.1300e- 003		187.7328

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/d	day							lb/c	lay		
Off-Road	1.6554	16.8035	12.4837	0.0186	i I	0.8110	0.8110		0.7479	0.7479	0.0000	1,873.826 4	1,873.826 4	0.5588		1,885.560 9
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	1.6554	16.8035	12.4837	0.0186		0.8110	0.8110		0.7479	0.7479	0.0000	1,873.826 4	1,873.826 4	0.5588		1,885.560 9

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3.5 Paving - 2017

<u>Mitigated Construction Off-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/d	day							lb/d	day		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0725	0.0870	1.0148	2.3200e- 003	0.1886	1.4400e- 003	0.1901	0.0500	1.3300e- 003	0.0514		187.5410	187.5410	9.1300e- 003		187.7328
Total	0.0725	0.0870	1.0148	2.3200e- 003	0.1886	1.4400e- 003	0.1901	0.0500	1.3300e- 003	0.0514		187.5410	187.5410	9.1300e- 003		187.7328

3.6 Architectural Coating - 2017 <u>Unmitigated Construction On-Site</u>

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/d	day							lb/d	lay		
Archit. Coating	22.5261					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e- 003		0.1733	0.1733		0.1733	0.1733		281.4481	281.4481	0.0297		282.0721
Total	22.8584	2.1850	1.8681	2.9700e- 003		0.1733	0.1733		0.1733	0.1733		281.4481	281.4481	0.0297		282.0721

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3.6 Architectural Coating - 2017 Unmitigated Construction Off-Site

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/d	day							lb/d	lay		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.6200e- 003	4.3500e- 003	0.0507	1.2000e- 004	9.4300e- 003	7.0000e- 005	9.5000e- 003	2.5000e- 003	7.0000e- 005	2.5700e- 003		9.3771	9.3771	4.6000e- 004		9.3866
Total	3.6200e- 003	4.3500e- 003	0.0507	1.2000e- 004	9.4300e- 003	7.0000e- 005	9.5000e- 003	2.5000e- 003	7.0000e- 005	2.5700e- 003		9.3771	9.3771	4.6000e- 004		9.3866

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/d	day							lb/d	lay		
Archit. Coating	22.5261					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e- 003		0.1733	0.1733		0.1733	0.1733	0.0000	281.4481	281.4481	0.0297	 	282.0721
Total	22.8584	2.1850	1.8681	2.9700e- 003		0.1733	0.1733		0.1733	0.1733	0.0000	281.4481	281.4481	0.0297		282.0721

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3.6 Architectural Coating - 2017 <u>Mitigated Construction Off-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/d	day							lb/d	lay		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	3.6200e- 003	4.3500e- 003	0.0507	1.2000e- 004	9.4300e- 003	7.0000e- 005	9.5000e- 003	2.5000e- 003	7.0000e- 005	2.5700e- 003		9.3771	9.3771	4.6000e- 004		9.3866
Total	3.6200e- 003	4.3500e- 003	0.0507	1.2000e- 004	9.4300e- 003	7.0000e- 005	9.5000e- 003	2.5000e- 003	7.0000e- 005	2.5700e- 003		9.3771	9.3771	4.6000e- 004		9.3866

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/d	day							lb/c	lay		
Mitigated	0.4093	0.8563	3.8486	8.3900e- 003	0.5735	0.0117	0.5852	0.1534	0.0108	0.1642		711.1347	711.1347	0.0281		711.7253
Unmitigated	0.4093	0.8563	3.8486	8.3900e- 003	0.5735	0.0117	0.5852	0.1534	0.0108	0.1642		711.1347	711.1347	0.0281		711.7253

4.2 Trip Summary Information

	Avei	age Daily Trip Ra	ate	Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	114.84	120.96	105.24	255,255	255,255
Total	114.84	120.96	105.24	255,255	255,255

4.3 Trip Type Information

		Miles			Trip %			Trip Purpos	se %
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.546114	0.062902	0.174648	0.122995	0.034055	0.004856	0.015640	0.024397	0.002087	0.003279	0.006673	0.000688	0.001667

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	egory lb/day									lb/c	lay					
NaturalGas Mitigated		0.1069	0.0455	6.8000e- 004		8.6400e- 003	8.6400e- 003		8.6400e- 003	8.6400e- 003		136.4691	136.4691	2.6200e- 003	2.5000e- 003	137.2997
NaturalGas Unmitigated	0.0125	0.1069	0.0455	6.8000e- 004		8.6400e- 003	8.6400e- 003		8.6400e- 003	8.6400e- 003		136.4691	136.4691	2.6200e- 003	2.5000e- 003	137.2997

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5.2 Energy by Land Use - NaturalGas <u>Unmitigated</u>

	NaturalGa s Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	Land Use kBTU/yr lb/day										lb/d	day					
Single Family Housing	1159.99	0.0125	0.1069	0.0455	6.8000e- 004		8.6400e- 003	8.6400e- 003		8.6400e- 003	8.6400e- 003		136.4691	136.4691	2.6200e- 003	2.5000e- 003	137.2997
Total		0.0125	0.1069	0.0455	6.8000e- 004		8.6400e- 003	8.6400e- 003		8.6400e- 003	8.6400e- 003		136.4691	136.4691	2.6200e- 003	2.5000e- 003	137.2997

Mitigated

	NaturalGa s Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr					lb/d	day							lb/d	day		
Single Family Housing	1.15999	0.0125	0.1069	0.0455	6.8000e- 004		8.6400e- 003	8.6400e- 003		8.6400e- 003	8.6400e- 003		136.4691	136.4691	2.6200e- 003	2.5000e- 003	137.2997
Total		0.0125	0.1069	0.0455	6.8000e- 004		8.6400e- 003	8.6400e- 003		8.6400e- 003	8.6400e- 003		136.4691	136.4691	2.6200e- 003	2.5000e- 003	137.2997

6.0 Area Detail

6.1 Mitigation Measures Area

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Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	gory lb/day							lb/day								
Mitigated	0.7071	0.0117	1.0015	5.0000e- 005		0.0252	0.0252	 	0.0249	0.0249	0.0000	313.0768	313.0768	7.7600e- 003	5.7100e- 003	315.0088
Unmitigated	24.5344	0.3224	29.6350	8.7300e- 003		4.0075	4.0075	i i	4.0074	4.0074	413.6548	164.8415	578.4963	0.3043	0.0338	595.3756

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day											lb/d	day			
Architectural Coating	0.1852					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.4622		1 1 1 1			0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	23.8558	0.3107	28.6350	8.6800e- 003		4.0021	4.0021		4.0020	4.0020	413.6548	163.0588	576.7137	0.3025	0.0338	593.5554
Landscaping	0.0311	0.0117	1.0000	5.0000e- 005		5.4300e- 003	5.4300e- 003		5.4300e- 003	5.4300e- 003		1.7826	1.7826	1.7900e- 003		1.8202
Total	24.5344	0.3224	29.6350	8.7300e- 003		4.0075	4.0075		4.0074	4.0074	413.6548	164.8415	578.4963	0.3043	0.0338	595.3756

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6.2 Area by SubCategory

Mitigated

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day											lb/d	day			
Architectural Coating	0.1852					0.0000	0.0000	 	0.0000	0.0000			0.0000			0.0000
Consumer Products	0.4622					0.0000	0.0000	 	0.0000	0.0000			0.0000			0.0000
Hearth	0.0285	0.0000	1.5600e- 003	0.0000		0.0197	0.0197	1 	0.0195	0.0195	0.0000	311.2941	311.2941	5.9700e- 003	5.7100e- 003	313.1886
Landscaping	0.0311	0.0117	1.0000	5.0000e- 005		5.4300e- 003	5.4300e- 003	1 1 1 1 1	5.4300e- 003	5.4300e- 003		1.7826	1.7826	1.7900e- 003		1.8202
Total	0.7071	0.0117	1.0016	5.0000e- 005		0.0252	0.0252		0.0249	0.0249	0.0000	313.0768	313.0768	7.7600e- 003	5.7100e- 003	315.0088

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

ATTACHMENT 2

HEALTH RISK ANALYSIS
SCREEN3 MODEL OUTPUT

```
** Input units switched from English to metric
** AREA DATA
                Rate Height Length Width Angle Szinit
        0.6829E-02 4.5720 152.4000 91.4400 0.0 3.05
** BUILDING DATA BPIP Height Max dim. Min dim. Orient. Direct. Offset
          N 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000
** MAKEMET DATA MinT MaxT Speed AnemHt Surf Clim Albedo Bowen Length SC FILE
        249.82 310.93 2.5 10.000 7 1 0.1400 1.0000 1.0000 "NA"
** TERRAIN DATA Terrain UTM East UTM North Zone Nada Probe PROFBASE Use AERMAP elev
          Ν
                0.0 0.0 0 0 5000.0
                                            0.00
                                                      Ν
** DISCRETE RECEPTORS Discflag Receptor file
           N "NA"
** UNITS/POPULATION Units R/U Population Amb. dist. Flagpole Flagpole height
                            1.000 N 0.00
           M U 40000.
** OUTPUT FILE "busk4.out"
** Temporal sector: Spring, flow vector: 0 degrees, spatial sector: 1
CO STARTING
 TITLEONE Busk
       FLOWSECTOR STAGE 2
 MODELOPT CONC SCREEN FLAT FASTAREA
 AVERTIME 1
 URBANOPT 40000.
 POLLUTID OTHER
 RUNORNOT RUN
CO FINISHED
SO STARTING
 LOCATION SOURCE AREA
                         -76.20 -45.72
 SRCPARAM SOURCE 0.4901E-06 4.572 152.400 91.440 0.000 3.048
 URBANSRC SOURCE
 SRCGROUP ALL
SO FINISHED
RE STARTING
** Fence line receptor
 DISCCART
                     0.00
** Automatic receptors
 DISCCART
             25.00
                      0.00
             50.00
                      0.00
 DISCCART
 DISCCART
             75.00
                      0.00
 DISCCART
            100.00
                      0.00
 DISCCART
            125.00
                      0.00
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 DISCCART
           175.00
                      0.00
 DISCCART
            200.00
                      0.00
 DISCCART
            225.00
                      0.00
 DISCCART
            250.00
                      0.00
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DISCCART

DISCCART

275.00

300.00

0.00

0.00

DISCCART	325.00	0.00
DISCCART	350.00	0.00
DISCCART	375.00	0.00
DISCCART	400.00	0.00
DISCCART	425.00	0.00
DISCCART	450.00	0.00
DISCCART	475.00	0.00
DISCCART	500.00	0.00
DISCCART	525.00	0.00
DISCCART	550.00	0.00
DISCCART	575.00	0.00
		0.00
DISCCART	600.00	
DISCCART	625.00	0.00
DISCCART	650.00	0.00
DISCCART	675.00	0.00
DISCCART	700.00	0.00
DISCCART	725.00	0.00
DISCCART	750.00	0.00
DISCCART	775.00	0.00
DISCCART	800.00	0.00
DISCCART	825.00	0.00
DISCCART	850.00	0.00
DISCCART	875.00	0.00
DISCCART	900.00	0.00
DISCCART	925.00	0.00
DISCCART	950.00	0.00
DISCCART	975.00	0.00
DISCCART	1000.00	0.00
DISCCART	1025.00	0.00
DISCCART	1050.00	0.00
DISCCART	1075.00	0.00
DISCCART	1100.00	0.00
DISCCART	1125.00	0.00
DISCCART	1150.00	0.00
DISCCART	1175.00	0.00
DISCCART	1200.00	0.00
DISCCART	1225.00	0.00
		0.00
DISCCART	1250.00	
DISCCART	1275.00	0.00
DISCCART	1300.00	0.00
DISCCART	1325.00	0.00
DISCCART	1350.00	0.00
DISCCART	1375.00	
		0.00
DISCCART	1400.00	0.00
DISCCART	1425.00	0.00
DISCCART	1450.00	0.00
DISCCART	1475.00	0.00
DISCCART	1500.00	0.00
DISCCART	1525.00	0.00
DISCCART	1550.00	0.00
DISCCART	1575.00	0.00
DISCCART	1600.00	0.00
DISCCART	1625.00	0.00
DISCCART	1650.00	0.00
DISCCART	1675.00	0.00
DISCCART	1700.00	0.00
DISCCART	1725.00	0.00
DISCCART	1750.00	0.00
DISCCART	1775.00	0.00
DISCCART	1800.00	
		0.00
DISCCART	1825.00	0.00

DISCCART	1850.00	0.00
DISCCART	1875.00	0.00
DISCCART	1900.00	0.00
DISCCART	1925.00	0.00
DISCCART	1950.00	0.00
DISCCART	1975.00	0.00
DISCCART	2000.00	0.00
DISCCART	2025.00	0.00
DISCCART	2050.00	0.00
DISCCART	2075.00	0.00
DISCCART	2100.00	0.00
DISCCART	2125.00	0.00
DISCCART	2150.00	0.00
DISCCART	2175.00	0.00
DISCCART	2200.00	0.00
DISCCART	2225.00	0.00
DISCCART	2250.00	0.00
DISCCART	2275.00	0.00
DISCCART	2300.00	0.00
DISCCART	2325.00	0.00
DISCCART	2350.00	0.00
DISCCART	2375.00	0.00
DISCCART	2400.00	0.00
DISCCART	2425.00	0.00
DISCCART	2450.00	0.00
DISCCART	2475.00	0.00
DISCCART	2500.00	0.00
DISCCART	2525.00	0.00
DISCCART	2550.00	0.00
DISCCART	2575.00	0.00
DISCCART	2600.00	0.00
DISCCART	2625.00	0.00
DISCCART	2650.00	0.00
DISCCART	2675.00	0.00
DISCCART	2700.00	0.00
DISCCART	2725.00	0.00
DISCCART	2750.00	0.00
DISCCART	2775.00	0.00
DISCCART	2800.00	0.00
DISCCART	2825.00	0.00
DISCCART	2850.00	0.00
DISCCART	2875.00	0.00
DISCCART	2900.00	0.00
DISCCART	2925.00	0.00
DISCCART	2950.00	0.00
DISCCART	2975.00	0.00
DISCCART	3000.00	0.00
DISCCART	3025.00	0.00
DISCCART	3050.00	0.00
DISCCART	3075.00	0.00
DISCCART	3100.00	0.00
DISCCART	3125.00	0.00
DISCCART	3150.00	0.00
DISCCART	3175.00	0.00
DISCCART	3200.00	0.00
DISCCART	3225.00	0.00
DISCCART	3250.00	0.00
DISCCART	3275.00	0.00
DISCCART	3300.00	0.00
DISCCART	3325.00	0.00
DISCCART	3350.00	0.00

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*** SETUP Fir		sfully *** ******				
MODELOPT	*		FLAT	*** 13:00:52 PAGE 1	***	11/03/15
	**	* MODEL SETUP O	PTIONS SUM	MARY ***		
**Model Is Se	etup For Calcu	ulation of Average CC	NCentration	Values.		
**Model Use:	POSITION Da LE DEPOSITIC s NO DRY DEF	ta Provided. IN Data Provided. PLETION. DRYDPLT = PLETION. WETDPLT				
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1. Stack-t 2. Model 3. Use Ca 4. Use Mi 5. No Exp	ip Downwash Assumes Rec Ilms Processin issing Data Proponential Dec	ceptors on FLAT Terra ng Routine. cocessing Routine.				

**Other Options Specified:

NOCHKD - Suppresses checking of date sequence in meteorology files

FASTAREA - Use hybrid approach to optimize AREA sources (formerly TOXICS option) SCREEN - Use screening option which forces calculation of centerline values **Model Assumes No FLAGPOLE Receptor Heights. **Model Calculates 1 Short Term Average(s) of: 1-HR **This Run Includes: 1 Source(s); 1 Source Group(s); and 201 Receptor(s) **The Model Assumes A Pollutant Type of: OTHER **Model Set To Continue RUNning After the Setup Testing. **Output Options Selected: Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword) Model Outputs Tables of Overall Maximum Short Term Values (MAXTABLE Keyword) Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword) Model Outputs External File(s) of Ranked Values (RANKFILE Keyword) NOTE: Option for EXPonential format used in formatted output result files (FILEFORM Keyword) **NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours m for Missing Hours b for Both Calm and Missing Hours **Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 0.00; Decay Coef. = 0.000; Rot. Angle = Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07 Output Units = MICROGRAMS/M**3 **Approximate Storage Requirements of Model = 3.5 MB of RAM. *** AERMOD - VERSION 11353 *** *** Busk 11/03/15 13:00:52 PAGE 2 **MODELOPTs: NonDFAULT CONC FLAT NOCHKD FASTAREA SCREEN

*** AREA SOURCE DATA ***

NUMBER EMISSION RATE COORD (SW CORNER) BASE RELEASE X-DIM Y-DIM ORIENT. INIT. URBAN EMISSION RATE SOURCE PART. (GRAMS/SEC X Y ELEV. HEIGHT OF AREA OF AREA OF AREA SZ SOURCE SCALAR VARY ID CATS. /METERS) (METERS) (METERS) (METERS) (METERS) (METERS) (METERS) BY

> ** *** 13:00:52 PAGE 3

**MODELOPTs: NonDFAULT CONC FLAT

NOCHKD FASTAREA SCREEN

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID SOURCE IDs

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ALL SOURCE ,

*** AERMOD - VERSION 11353 *** *** Busk

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*** 11/03/15 13:00:52

PAGE 4

**MODELOPTs: NonDFAULT CONC
NOCHKD FASTAREA SCREEN

FLAT

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

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*** AERMOD - VERSION 11353 ***
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*** 13:00:52

PAGE 5

*** DISCRETE CARTESIAN RECEPTORS *** (X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG) (METERS)

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(4100.0,	0.0,	0.0,	0.0,	0.0);	(4125.0,	0.0,	0.0,	0.0,	0.0);	
(4150.0,	0.0,	0.0,	0.0,	0.0);	(4175.0,	0.0,	0.0,	0.0,	0.0);	
(4200.0,	0.0,	0.0,	0.0,	0.0);	(4225.0,	0.0,	0.0,	0.0,	0.0);	
(4250.0,	0.0,	0.0,	0.0,	0.0);	(4275.0,	0.0,	0.0,	0.0,	0.0);	
(4300.0,	0.0,	0.0,	0.0,	0.0);	•	4325.0,	0.0,	0.0,	0.0,	0.0);	
(4350.0,	0.0,	0.0,	0.0,	0.0);		4375.0,	0.0,	0.0,	0.0,	0.0);	
(4400.0,	0.0,	0.0,	0.0,	0.0);	-	4425.0,	0.0,	0.0,	0.0,	0.0);	
(4450.0,	0.0,	0.0,	0.0,	0.0);		4475.0,	0.0,	0.0,	0.0,	0.0);	
***	* AERMOD			353 ***	*** Busl	K					***	11/03/15
*** 13:00:52												

**MODELOPTS: NonDFAULT CONC FLAT NOCHKD FASTAREA SCREEN

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

PAGE 6

(4500.0, 0.0, 0.0, 0.0); (4525.0, 0.0, 0.0, 0.0);

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 (5000.0,
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                    0.0,
                          0.0);
*** AERMOD - VERSION 11353 *** *** Busk
                                                             11/03/15
                                              13:00:52
                                            PAGE 7
**MODELOPTs: NonDFAULT CONC
                                    FLAT
     NOCHKD FASTAREA SCREEN
                *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                       (1=YES; 0=NO)
    1111111111 111111
     NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.
            *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                      (METERS/SEC)
                 1.54, 3.09, 5.14, 8.23, 10.80,
*** AERMOD - VERSION 11353 *** *** Busk
                                                             11/03/15
                                              13:00:52
                                            PAGE 8
**MODELOPTs: NonDFAULT CONC
                                    FLAT
     NOCHKD FASTAREA SCREEN
             *** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***
Surface file: AERSCREEN.SFC
                                              Met Version: SCREEN
Profile file: AERSCREEN.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 11111
                          Upper air station no.: 22222
      Name: SCREEN
                              Name: SCREEN
                            Year: 2010
      Year: 2010
First 24 hours of scalar data
YR MO DY JDY HR HO U* W* DT/DZ ZICNV ZIMCH M-O LEN ZO BOWEN ALBEDO REF WS WD HT REF TA HT
______
10 01 01 1 01 -37.3 0.346 -9.000 0.020 -999. 468. 85.2 1.00 1.00 0.14 2.50 270. 10.0 249.8 2.0
10 01 02 2 01 -33.0 0.364 -9.000 0.020 -999. 505. 112.0 1.00 1.00 0.14 2.50 270. 10.0 249.8 2.0
10 01 03 3 01 -4.5 0.427 -9.000 0.020 -999. 642. 1332.0 1.00 1.00 0.14 2.50 270. 10.0 249.8 2.0
10 01 04 4 01 -39.6 0.368 -9.000 0.020 -999. 513. 119.6 1.00 1.00 0.14 2.50 270. 10.0 310.9 2.0
```

10 01 05 5 01 -34.5 0.380 -9.000 0.020 -999. 539. 152.2 1.00 1.00 0.14 2.50 270. 10.0 310.9 2.0 10 01 06 6 01 -4.5 0.429 -9.000 0.020 -999. 646. 1668.6 1.00 1.00 0.14 2.50 270. 10.0 310.9 2.0

```
10 01 07 7 01 -21.4 0.395 -9.000 0.020 -999. 572. 221.4 1.00 1.00 0.14 2.50 270. 10.0 249.8 2.0
10 01 08 8 01 -18.3 0.402 -9.000 0.020 -999. 587. 272.6 1.00 1.00 0.14 2.50 270. 10.0 249.8 2.0
10 01 09 9 01 -2.3 0.431 -9.000 0.020 -999. 650. 2694.2 1.00 1.00 0.14 2.50 270. 10.0 249.8 2.0
10 01 10 10 01 -21.9 0.404 -9.000 0.020 -999. 590. 287.2 1.00 1.00 0.14 2.50 270. 10.0 310.9 2.0
10 01 11 11 01 -21.9 0.404 -9.000 0.020 -999. 590. 287.2 1.00 1.00 0.14 2.50 270. 10.0 310.9 2.0
10 01 12 12 01 -21.9 0.404 -9.000 0.020 -999. 590. 287.2 1.00 1.00 0.14 2.50 270. 10.0 310.9 2.0
10 01 13 13 01 -64.0 0.652 -9.000 0.020 -999. 1212. 332.8 1.00 1.00 0.14 4.00 270. 10.0 249.8 2.0
10 01 14 14 01 -59.4 0.656 -9.000 0.020 -999. 1221. 364.1 1.00 1.00 0.14 4.00 270. 10.0 249.8 2.0
10 01 15 15 01 -7.3 0.691 -9.000 0.020 -999. 1320. 3478.4 1.00 1.00 0.14 4.00 270. 10.0 249.8 2.0
10 01 16 16 01 -64.0 0.662 -9.000 0.020 -999. 1238. 432.2 1.00 1.00 0.14 4.00 270. 10.0 310.9 2.0
10 01 17 17 01 -60.2 0.664 -9.000 0.020 -999. 1244. 464.4 1.00 1.00 0.14 4.00 270. 10.0 310.9 2.0
10 01 18 18 01 -7.3 0.691 -9.000 0.020 -999. 1322. 4340.0 1.00 1.00 0.14 4.00 270. 10.0 310.9 2.0
10 01 19 19 01 -36.4 0.672 -9.000 0.020 -999. 1267. 639.2 1.00 1.00 0.14 4.00 270. 10.0 249.8 2.0
10\ 01\ 20\ 20\ 01\ -30.8\ 0.676\ -9.000\ 0.020\ -999.\ 1278.\quad 769.5\ 1.00\quad 1.00\quad 0.14\quad 4.00\ 270.\quad 10.0\ 249.8\quad 2.0
10 01 21 21 01 -3.7 0.693 -9.000 0.020 -999. 1326. 6965.2 1.00 1.00 0.14 4.00 270. 10.0 249.8 2.0
10 01 22 22 01 -36.7 0.677 -9.000 0.020 -999. 1280. 806.5 1.00 1.00 0.14 4.00 270. 10.0 310.9 2.0
10 01 23 23 01 -36.7 0.677 -9.000 0.020 -999. 1280. 806.5 1.00 1.00 0.14 4.00 270. 10.0 310.9 2.0
10 01 24 24 01 -36.7 0.677 -9.000 0.020 -999. 1280. 806.5 1.00 1.00 0.14 4.00 270. 10.0 310.9 2.0
```

First hour of profile data

YR MO DY HR HEIGHT F WDIR WSPD AMB_TMP sigmaA sigmaW sigmaV 10 01 01 01 10.0 1 270. 2.50 249.9 99.0 -99.00 -99.00

F indicates top of profile (=1) or below (=0)

*** AERMOD - VERSION 11353 *** *** Busk

*** 11/03/15

13:00:52 PAGE 9

**MODELOPTS: NonDFAULT CONC
NOCHKD FASTAREA SCREEN

FLAT

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL *** INCLUDING SOURCE(S): SOURCE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3

X-COORD (N	И) Y-COC	RD (M)	CONC	(YYMMDDH	H)	X-COORD	(M) Y-COOI	RD (M)	CONC	(YYMMDD	HH)
 1.00	0.00	2.24426 (1001010)1)	25.00	0.00	2.61019 (1	.0010101)			
50.00	0.00	2.89117	(100101	01)	75.00	0.00	3.06716 (10010101)			
100.00	0.00	2.42801	(10010	101)	125.00	0.00	1.72795	(1001010	1)		
150.00	0.00	1.28749	(10010	101)	175.00	0.00	1.00526	(1001010	1)		
200.00	0.00	0.81353	(10010	101)	225.00	0.00	0.67733	(1001010	1)		
250.00	0.00	0.57579	(10010	101)	275.00	0.00	0.49802	(1001010	1)		
300.00	0.00	0.43650	(10010	101)	325.00	0.00	0.38731	(1001010	1)		
350.00	0.00	0.34701	(10010	101)	375.00	0.00	0.31328	(1001010	1)		
400.00	0.00	0.28487	(10010	101)	425.00	0.00	0.26065	(1001010	1)		
450.00	0.00	0.23983	(10010	101)	475.00	0.00	0.22176	(1001010	1)		
500.00	0.00	0.20583	(10010	101)	525.00	0.00	0.19180	(1001010	1)		
550.00	0.00	0.17936	(10010	101)	575.00	0.00	0.16827	(1001010	1)		
600.00	0.00	0.15832	(10010	101)	625.00	0.00	0.14935	(1001010	1)		
650.00	0.00	0.14124	(10010	101)	675.00	0.00	0.13387	(1001010	1)		
700.00	0.00	0.12715	(10010	101)	725.00	0.00	0.12096	(1001010	1)		
750.00	0.00	0.11528	(10010	101)	775.00	0.00	0.11006	(1001010	1)		
800.00	0.00	0.10521	(10010	101)	825.00	0.00	0.10071	(1001010	1)		
850.00	0.00	0.09653	(10010	101)	875.00	0.00	0.09265	(1001010	1)		
900.00	0.00	0.08902	(10010	101)	925.00	0.00	0.08564	(1001010	1)		
950.00	0.00	0.08248	(10010	101)	975.00	0.00	0.07951	(1001010	1)		
1000.00	0.00	0.07672	(10010	101)	1025.00	0.00	0.07410	(100101	01)		

1050.00	0.00	0.07163 (10010101)	1075.00	0.00	0.06930 (10010101)
1100.00	0.00	0.06709 (10010101)	1125.00	0.00	0.06501 (10010101)
1150.00	0.00	0.06304 (10010101)	1175.00	0.00	0.06116 (10010101)
1200.00	0.00	0.05939 (10010101)	1225.00	0.00	0.05770 (10010101)
1250.00	0.00	0.05609 (10010101)	1275.00	0.00	0.05456 (10010101)
1300.00	0.00	0.05309 (10010101)	1325.00	0.00	0.05170 (10010101)
1350.00	0.00	0.05037 (10010101)	1375.00	0.00	0.04910 (10010101)
1400.00	0.00	0.04788 (10010101)	1425.00	0.00	0.04671 (10010101)
1450.00	0.00	0.04559 (10010101)	1475.00	0.00	0.04452 (10010101)
1500.00	0.00	0.04349 (10010101)	1525.00	0.00	0.04250 (10010101)
1550.00	0.00	0.04155 (10010101)	1575.00	0.00	0.04063 (10010101)
1600.00	0.00	0.03975 (10010101)	1625.00	0.00	0.03891 (10010101)
1650.00	0.00	0.03817 (10010101)	1675.00	0.00	0.03738 (10010101)
1700.00	0.00	0.03661 (10010101)	1725.00	0.00	0.03588 (10010101)
1750.00	0.00	0.03517 (10010101)	1775.00	0.00	0.03448 (10010101)
1800.00	0.00	0.03382 (10010101)	1825.00	0.00	0.03318 (10010101)
1850.00	0.00	0.03256 (10010101)	1875.00	0.00	0.03195 (10010101)
1900.00	0.00	0.03137 (10010101)	1925.00	0.00	0.03081 (10010101)
1950.00	0.00	0.03026 (10010101)	1975.00	0.00	0.02973 (10010101)
*** AERMOD	- VERSION	11353 *** *** Busk			*** 11/03/15
	***		***	13:00:5	2
			PA	GE 10	

**MODELOPTS: NonDFAULT CONC FLAT NOCHKD FASTAREA SCREEN

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL *** INCLUDING SOURCE(S): SOURCE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3

X-COORD (M)	Y-COORD	(M)	CONC	(YYMMDDHH)	X-COORD (M)	Y-COORI	D (M)	CONC	(YYMMDDHH)
2000.00	0.00	0.02922	(10010	101)	2025.00	0.00	0.02872	(1001010	01)	
2050.00	0.00		•	•	2075.00		0.02776	•	•	
2100.00	0.00	0.02731	•	,	2125.00		0.02686	•	,	
2150.00	0.00	0.02643			2175.00		0.02601	•	•	
2200.00	0.00	0.02560	•	,	2225.00		0.02520	•	,	
2250.00	0.00	0.02482	•	,	2275.00		0.02444	•	,	
2300.00	0.00	0.02407	(10010	101)	2325.00	0.00	0.02371	(1001010)1)	
2350.00	0.00	0.02337	(10010	101)	2375.00	0.00	0.02303	(1001010)1)	
2400.00	0.00	0.02269	(10010	101)	2425.00	0.00	0.02237	(1001010)1)	
2450.00	0.00	0.02206	(10010	101)	2475.00	0.00	0.02175	(1001010	01)	
2500.00	0.00	0.02145	(10010	101)	2525.00	0.00	0.02116	(1001010	01)	
2550.00	0.00	0.02087	(10010	101)	2575.00	0.00	0.02059	(1001010	01)	
2600.00	0.00	0.02032	(10010	101)	2625.00	0.00	0.02005	(1001010	01)	
2650.00	0.00	0.01979	(10010	101)	2675.00	0.00	0.01953	(1001010	01)	
2700.00	0.00	0.01928	(10010	101)	2725.00	0.00	0.01904	(1001010	01)	
2750.00	0.00	0.01880	(10010	101)	2775.00	0.00	0.01857	(1001010	01)	
2800.00	0.00	0.01834	(10010	101)	2825.00	0.00	0.01811	(1001010)1)	
2850.00	0.00	0.01790	(10010	101)	2875.00	0.00	0.01768	(1001010)1)	
2900.00	0.00	0.01747	(10010	101)	2925.00	0.00	0.01726	(1001010	01)	
2950.00	0.00	0.01706	(10010	101)	2975.00	0.00	0.01687	(1001010	01)	
3000.00	0.00	0.01667	(10010	101)	3025.00	0.00	0.01648	(1001010	01)	
3050.00	0.00	0.01630	(10010	101)	3075.00	0.00	0.01611	(1001010	01)	
3100.00	0.00	0.01593	(10010	101)	3125.00	0.00	0.01576	(1001010	01)	
3150.00	0.00	0.01559	(10010	101)	3175.00	0.00	0.01542	(1001010	01)	
3200.00	0.00	0.01525	(10010	101)	3225.00	0.00	0.01509	(1001010	01)	
3250.00	0.00	0.01493	(10010	101)	3275.00	0.00	0.01477	(1001010	01)	
3300.00	0.00	0.01462	(10010	101)	3325.00	0.00	0.01447	(1001010	01)	

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0.00
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   3350.00
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   3400.00
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                      0.01403 (10010101)
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                                                3475.00
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                                                3575.00
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                                                3625.00
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                                                3675.00
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                                                                  0.01260 (10010101)
   3700.00
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                                                3725.00
                                                           0.00
                                                                  0.01237 (10010101)
   3750.00
              0.00
                     0.01226 (10010101)
                                                3775.00
                                                           0.00
                                                                  0.01214 (10010101)
   3800.00
              0.00
                     0.01203 (10010101)
                                                3825.00
                                                           0.00
                                                                  0.01193 (10010101)
   3850.00
              0.00
                     0.01182 (10010101)
                                                3875.00
                                                           0.00
                                                                  0.01171 (10010101)
                                                                  0.01151 (10010101)
   3900.00
              0.00
                     0.01161 (10010101)
                                                3925.00
                                                           0.00
              0.00
                     0.01141 (10010101)
                                                3975.00
                                                                  0.01131 (10010101)
   3950.00
                                                           0.00
                                                                     *** 11/03/15
*** AERMOD - VERSION 11353 *** *** Busk
                                                   *** 13:00:52
                                                      PAGE 11
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**MODELOPTS: NonDFAULT CONC FLAT

NOCHKD FASTAREA SCREEN

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL *** INCLUDING SOURCE(S): SOURCE ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3

X-COORD (M)	Y-COORE	(M)	CONC	(YYMMDDHH)	X-COORD (M)	Y-COOR	D (M) CONC	(YYMMDDHH)
4000.00	0.00	0.01121	(10010	 101)	4025.00	0.00	0.01112	(10010101)	
4050.00	0.00	0.01102	(10010	101)	4075.00	0.00	0.01093	(10010101)	
4100.00	0.00	0.01084	(10010	101)	4125.00	0.00	0.01075	(10010101)	
4150.00	0.00	0.01066	(10010	101)	4175.00	0.00	0.01057	(10010101)	
4200.00	0.00	0.01048	(10010	101)	4225.00	0.00	0.01040	(10010101)	
4250.00	0.00	0.01032	(10010	101)	4275.00	0.00	0.01023	(10010101)	
4300.00	0.00	0.01015	(10010	101)	4325.00	0.00	0.01007	(10010101)	
4350.00	0.00	0.00999	(10010	101)	4375.00	0.00	0.00991	(10010101)	
4400.00	0.00	0.00983	(10010	101)	4425.00	0.00	0.00976	(10010101)	
4450.00	0.00	0.00968	(10010	101)	4475.00	0.00	0.00961	(10010101)	
4500.00	0.00	0.00954	(10010	101)	4525.00	0.00	0.00946	(10010101)	
4550.00	0.00	0.00939	(10010	101)	4575.00	0.00	0.00932	(10010101)	
4600.00	0.00	0.00925	(10010	101)	4625.00	0.00	0.00918	(10010101)	
4650.00	0.00	0.00911	(10010	101)	4675.00	0.00	0.00905	(10010101)	
4700.00	0.00	0.00898	(10010	101)	4725.00	0.00	0.00892	(10010101)	
4750.00	0.00	0.00885	(10010	101)	4775.00	0.00	0.00879	(10010101)	
4800.00	0.00	0.00873	(10010	101)	4825.00	0.00	0.00866	(10010101)	
4850.00	0.00	0.00860	(10010	101)	4875.00	0.00	0.00854	(10010101)	
4900.00	0.00	0.00848	(10010	101)	4925.00	0.00	0.00842	(10010101)	
4950.00	0.00	0.00836	(10010	101)	4975.00	0.00	0.00831	(10010101)	
5000.00	0.00	0.00825	(10010	101)					
*** AERMOD - \	ERSION :	11353 **	* *** E	Busk			***	11/03/15	
	***				***	13:00:52			
						PAGE 12			
**MODELOPTs:	NonDFAU	LT CONC		FL	AT				

**MODELOPTs: Nondfault conc Flat Nochkd Fastarea screen

*** THE MAXIMUM 50 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SOURCE ,

** CONC OF OTHER IN MICROGRAMS/M**3 *

RANK CONC (YYMMDDHH) AT RECEPTOR (XR,YR) OF TYPE RANK CONC (YYMMDDHH) AT RECEPTOR (XR,YR) OF TYPE

```
0.00) DC
                                                                                              0.00) DC
 1.
       3.06716 (10010101) AT (
                                75.00,
                                                     26.
                                                            2.37096 (10010501) AT (
                                                                                     25.00.
       2.90292 (10010201) AT (
                                75.00,
                                         0.00) DC
                                                            2.29735 (10010301) AT (
                                                                                     50.00,
                                                                                              0.00) DC
 2.
                                                     27.
 3.
       2.89117 (10010101) AT (
                                50.00,
                                         0.00) DC
                                                            2.29357 (10010701) AT (
                                                                                     25.00,
                                                                                              0.00) DC
                                                     28.
                                75.00,
                                                                                              0.00) DC
  4.
       2.84164 (10010401) AT (
                                         0.00) DC
                                                     29.
                                                            2.27519 (10010901) AT (
                                                                                     50.00.
  5.
       2.74443 (10010501) AT (
                                75.00,
                                         0.00) DC
                                                     30.
                                                            2.27146 (10010201) AT (
                                                                                    100.00,
                                                                                               0.00) DC
  6.
       2.74289 (10010201) AT (
                                50.00,
                                         0.00) DC
                                                     31.
                                                            2.27130 (10010601) AT (
                                                                                     50.00,
                                                                                              0.00) DC
 7.
       2.69013 (10010401) AT (
                                50.00,
                                         0.00) DC
                                                     32.
                                                            2.25417 (10010801) AT (
                                                                                     25.00,
                                                                                              0.00) DC
 8.
       2.65567 (10010701) AT (
                                75.00,
                                         0.00) DC
                                                     33.
                                                            2.24426 (10010101) AT (
                                                                                     1.00,
                                                                                              0.00) DC
 9.
       2.61019 (10010101) AT (
                                25.00,
                                         0.00) DC
                                                     34.
                                                            2.23242 (10011001) AT (
                                                                                     25.00,
                                                                                              0.00) DC
 10.
       2.60548 (10010801) AT (
                                75.00,
                                          0.00) DC
                                                      35.
                                                            2.23242 (10011101) AT ( 25.00,
                                                                                               0.00) DC
                                          0.00) DC
 11.
        2.60105 (10010501) AT (
                                50.00,
                                                      36.
                                                            2.23242 (10011201) AT ( 25.00,
                                                                                               0.00) DC
                                75.00,
                                          0.00) DC
 12.
        2.56888 (10011001) AT (
                                                      37.
                                                            2.19379 (10010401) AT ( 100.00,
                                                                                               0.00) DC
                                                                                              0.00) DC
 13.
        2.56888 (10011101) AT (
                                 75.00,
                                          0.00) DC
                                                      38.
                                                            2.14599 (10010201) AT (
                                                                                      1.00,
 14.
        2.56888 (10011201) AT (
                                 75.00,
                                          0.00) DC
                                                      39.
                                                            2.12371 (10010301) AT (
                                                                                     25.00,
                                                                                               0.00) DC
                                          0.00) DC
                                                            2.12328 (10010401) AT (
                                                                                              0.00) DC
 15.
        2.49224 (10010701) AT (
                                 50.00,
                                                      40.
                                                                                      1.00,
 16.
        2.48546 (10010201) AT (
                                25.00,
                                          0.00) DC
                                                      41.
                                                            2.10422 (10010901) AT (
                                                                                     25.00,
                                                                                               0.00) DC
                                                            2.10417 (10010601) AT ( 25.00,
 17.
                                50.00,
                                          0.00) DC
                                                      42.
        2.44698 (10010801) AT (
                                                                                               0.00) DC
 18.
        2.44673 (10010401) AT (
                                25.00,
                                          0.00) DC
                                                      43.
                                                            2.10387 (10010501) AT ( 100.00,
                                                                                               0.00) DC
 19.
        2.43995 (10010301) AT (
                                          0.00) DC
                                                      44.
                                                            2.06282 (10010501) AT (
                                                                                              0.00) DC
                                75.00,
                                                                                      1.00.
 20.
        2.42801 (10010101) AT (
                                100.00,
                                           0.00) DC
                                                      45.
                                                             2.04039 (10010701) AT ( 100.00,
                                                                                                0.00) DC
                                                      46.
 21.
        2.41768 (10011001) AT (
                                50.00,
                                          0.00) DC
                                                            1.99407 (10010801) AT ( 100.00,
                                                                                               0.00) DC
                                          0.00) DC
                                                                                              0.00) DC
 22.
        2.41768 (10011101) AT (
                                 50.00,
                                                      47.
                                                            1.99389 (10010701) AT (
                                                                                      1.00,
 23.
        2.41768 (10011201) AT (
                                 50.00,
                                          0.00) DC
                                                      48.
                                                            1.96238 (10010801) AT (
                                                                                      1.00,
                                                                                              0.00) DC
                                75.00,
                                          0.00) DC
                                                      49.
                                                            1.95151 (10011001) AT (
                                                                                              0.00) DC
        2.41551 (10010901) AT (
                                                                                      1.00,
 25.
        2.40754 (10010601) AT ( 75.00,
                                          0.00) DC
                                                      50.
                                                            1.95151 (10011101) AT (
                                                                                      1.00.
                                                                                              0.00) DC
 *** RECEPTOR TYPES: GC = GRIDCART
           GP = GRIDPOLR
           DC = DISCCART
           DP = DISCPOLR
 *** AERMOD - VERSION 11353 *** *** Busk
                                                                                    11/03/15
                                                                13:00:52
                                                             PAGE 13
**MODELOPTs: NonDFAULT CONC
                                                  FLAT
       NOCHKD FASTAREA SCREEN
                        *** THE SUMMARY OF HIGHEST 1-HR RESULTS ***
                  ** CONC OF OTHER IN MICROGRAMS/M**3
                           DATE
                                                                   NETWORK
GROUP ID
                      AVERAGE CONC (YYMMDDHH)
                                                           RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID
     HIGH 1ST HIGH VALUE IS
                               3.06716 ON 10010101: AT ( 75.00,
                                                                        0.00, 0.00, 0.00, 0.00) DC
*** RECEPTOR TYPES: GC = GRIDCART
           GP = GRIDPOLR
           DC = DISCCART
           DP = DISCPOLR
 *** AERMOD - VERSION 11353 *** *** Busk
                                                                                    11/03/15
                                                                13:00:52
                                                             PAGE 14
**MODELOPTs: NonDFAULT CONC
                                                   FLAT
       NOCHKD FASTAREA SCREEN
*** Message Summary : AERMOD Model Execution ***
```

Sum	nmary of Total Messages							
A Total of	- · · ·							
A Total of	0 Warning Message(s)							
A Total of	0 Informational Message(s)							
A Total of	216 Hours Were Processed							
A Total of	0 Calm Hours Identified							
A Total of	0 Missing Hours Identified (0.00 Percent)							
	****** FATAL ERROR MESSAGES ****** *** NONE ***							
	WARNING MESSAGES ******* NONE ***							
******	*******							
*** AERM	OD Finishes Successfully ***							

13:30:51

TITLE: Busk Mit	
******* AREA PA	
SOURCE EMISSION RATE: 0.265E-02 g/s	0.210E-01 lb/hr
AREA EMISSION RATE: 0.190E-06 g/(s-m2 AREA HEIGHT: 3.05 meters	
AREA SOURCE LONG SIDE: 152.40 meters AREA SOURCE SHORT SIDE: 91.44 meters INITIAL VERTICAL DIMENSION: 3.05 meters RURAL OR URBAN: URBAN POPULATION: 40000	300.00 feet
INITIAL PROBE DISTANCE = 5000. meters	16404. feet

MAXIMUM IMPACT RECEPTOR Zo SURFACE 1-HR CONC RADIAL DIST SECTOR ROUGHNESS (ug/m3) (deg) (m)	
1* 1.000 1.441 0 75.0 WIN * = worst case diagonal	

MIN/MAX TEMPERATURE: 249.8 / 310.9 (K)

MINIMUM WIND SPEED: 2.5 m/s

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Urban

DOMINANT CLIMATE TYPE: Average Moisture

DOMINANT SEASON: Winter

ALBEDO: 0.35 BOWEN RATIO: 1.50

ROUGHNESS LENGTH: 1.000 (meters)

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR MO DY JDY HR

-- -- -- --

10 01 01 1 01

HO U* W* DT/DZ ZICNV ZIMCH M-O LEN ZO BOWEN ALBEDO REF WS

-37.34 0.346 -9.000 0.020 -999. 468. 85.2 1.000 1.50 0.35 2.50

HT REF TA HT

10.0 249.8 2.0

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR MO DY JDY HR

-- -- -- ---

10 01 01 1 01

HO U* W* DT/DZ ZICNV ZIMCH M-O LEN ZO BOWEN ALBEDO REF WS

-37.34 0.346 -9.000 0.020 -999. 468. 85.2 1.000 1.50 0.35 2.50

HT REF TA HT

************* AERSCREEN AUTOMATED DISTANCES * OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

N	MAXIMUM	MAXIMUM				
DIST	1-HR CONC	DIST 1-HR CONC				
(m)	(ug/m3)	(m) (ug/m3)				
1.00	1.094	2525.00 0.9210E-02				
25.00	1.243	2550.00 0.9086E-02				
50.00	1.356	2575.00 0.8965E-02				
75.00	1.441	2600.00 0.8846E-02				
100.00	1.132	2625.00 0.8730E-02				
125.00	0.7330	2650.00 0.8616E-02				
150.00	0.5402	2675.00 0.8506E-02				
175.00	0.4228	2700.00 0.8397E-02				
200.00	0.3432	2725.00 0.8291E-02				
225.00	0.2863	2750.00 0.8187E-02				
250.00	0.2441	2775.00 0.8086E-02				
275.00	0.2115	2800.00 0.7986E-02				
300.00	0.1860	2824.99 0.7889E-02				
325.00	0.1651	2850.00 0.7794E-02				
350.00	0.1481	2875.00 0.7701E-02				
375.00	0.1340	2900.00 0.7609E-02				
400.00	0.1220	2925.00 0.7520E-02				
425.00	0.1117	2950.00 0.7432E-02				
450.00	0.1029	2975.00 0.7346E-02				
475.00	0.9516E-01	2999.99 0.7262E-02				
500.00	0.8842E-01	3025.00 0.7179E-02				
525.00	0.8247E-01	3050.00 0.7098E-02				
550.00	0.7718E-01	3075.00 0.7019E-02				
575.00	0.7243E-01	3100.00 0.6941E-02				
600.00	0.6817E-01	3125.00 0.6865E-02				
625.00	0.6434E-01	3150.00 0.6790E-02				
650.00	0.6086E-01	3174.99 0.6716E-02				
675.00	0.5770E-01	3199.99 0.6644E-02				
700.00	0.5482E-01	3225.00 0.6573E-02				
725.00	0.5217E-01	3249.99 0.6504E-02				
750.00	0.4975E-01	3275.00 0.6436E-02				
775.00	0.4751E-01	3300.00 0.6368E-02				
800.00	0.4545E-01	3325.00 0.6303E-02				
825.00	0.4353E-01	3350.00 0.6238E-02				

050.00	0.41755.01	2275 00	0.61745.03
850.00 875.00	0.4175E-01	3375.00	0.6174E-02
	0.4009E-01	3400.00	0.6112E-02
900.00	0.3854E-01	3425.00	0.6051E-02
925.00	0.3708E-01	3450.00	0.5990E-02
950.00	0.3572E-01	3475.00	0.5931E-02
975.00	0.3444E-01	3500.00	0.5873E-02
1000.00	0.3324E-01	3525.00	0.5816E-02
1025.00	0.3211E-01	3550.00	0.5759E-02
1050.00	0.3104E-01	3575.00	0.5704E-02
1075.00	0.3003E-01	3600.00	0.5650E-02
1100.00	0.2908E-01	3625.00	0.5596E-02
1125.00	0.2818E-01	3650.00	0.5543E-02
1150.00	0.2733E-01	3674.99	0.5492E-02
1175.00	0.2652E-01	3700.00	0.5441E-02
1200.00	0.2576E-01	3725.00	0.5390E-02
1225.00	0.2503E-01	3750.00	0.5341E-02
1250.00	0.2433E-01	3775.00	0.5292E-02
1275.00	0.2367E-01	3800.00	0.5245E-02
1300.00	0.2304E-01	3825.00	0.5198E-02
1325.00	0.2244E-01	3849.99	0.5151E-02
1350.00	0.2186E-01	3875.00	0.5106E-02
1375.00	0.2131E-01	3900.00	0.5061E-02
1400.00	0.2078E-01	3925.00	0.5016E-02
1425.00	0.2028E-01	3950.00	0.4973E-02
1450.00	0.1979E-01	3975.00	0.4930E-02
1475.00	0.1933E-01	4000.00	0.4887E-02
1500.00	0.1888E-01	4025.00	0.4846E-02
1525.00	0.1846E-01	4050.00	0.4805E-02
1550.00	0.1804E-01	4074.99	0.4764E-02
1575.00	0.1765E-01	4100.00	0.4724E-02
1600.00	0.1727E-01	4125.00	0.4685E-02
1625.00	0.1690E-01	4150.00	0.4646E-02
1650.00	0.1659E-01	4175.00	0.4608E-02
1675.00	0.1625E-01	4200.00	0.4570E-02
1700.00	0.1592E-01	4225.00	0.4533E-02
1725.00	0.1560E-01	4250.00	0.4497E-02
1750.00	0.1529E-01	4275.00	0.4461E-02
1775.00	0.1499E-01	4300.00	0.4425E-02
1800.00	0.1471E-01	4325.00	0.4390E-02
1825.00	0.1443E-01	4350.00	0.4355E-02
1850.00	0.1416E-01	4375.00	0.4321E-02
1875.00	0.1390E-01	4400.00	0.4287E-02
1900.00	0.1364E-01	4425.00	0.4254E-02
1925.00	0.1340E-01	4450.00	0.4221E-02
1950.00	0.1316E-01	4475.00	0.4189E-02
1975.00	0.1293E-01	4500.00	0.4157E-02
2000.00	0.1271E-01	4525.00	0.4125E-02
2025.00	0.1249E-01	4550.00	0.4094E-02
2050.00	0.1228E-01	4575.00	0.4064E-02

2075.00	0.1208E-01	4600.00	0.4033E-02
2100.00	0.1188E-01	4625.00	0.4003E-02
2125.00	0.1169E-01	4650.00	0.3974E-02
2150.00	0.1150E-01	4675.00	0.3945E-02
2175.00	0.1132E-01	4700.00	0.3916E-02
2200.00	0.1114E-01	4725.00	0.3888E-02
2225.00	0.1097E-01	4750.00	0.3859E-02
2250.00	0.1080E-01	4775.00	0.3832E-02
2275.00	0.1064E-01	4800.00	0.3804E-02
2300.00	0.1048E-01	4825.00	0.3777E-02
2325.00	0.1032E-01	4850.00	0.3751E-02
2350.00	0.1017E-01	4875.00	0.3724E-02
2375.00	0.1002E-01	4900.00	0.3698E-02
2400.00	0.9879E-02	4924.99	0.3673E-02
2425.00	0.9739E-02	4950.00	0.3647E-02
2450.00	0.9602E-02	4975.00	0.3622E-02
2475.00	0.9468E-02	5000.00	0.3597E-02
2500.00	0.9338E-02		

3-hour, 8-hour, and 24-hour scaled concentrations are equal to the 1-hour concentration as referenced in SCREENING PROCEDURES FOR ESTIMATING THE AIR QUALITY IMPACT OF STATIONARY SOURCES, REVISED (Section 4.5.4) Report number EPA-454/R-92-019 http://www.epa.gov/scram001/guidance_permit.htm under Screening Guidance

MAXIMUM SCALED SCALED SCALED **SCALED** 1-HOUR 3-HOUR 8-HOUR 24-HOUR **ANNUAL** CALCULATION CONC CONC CONC CONC CONC PROCEDURE (ug/m3) (ug/m3) (ug/m3) (ug/m3) FLAT TERRAIN 1.447 1.447 1.447 1.447 N/A

DISTANCE FROM SOURCE 77.00 meters

IMPACT AT THE
AMBIENT BOUNDARY 1.094 1.094 1.094 1.094 N/A

DISTANCE FROM SOURCE 1.00 meters

ATTACHMENT 3

BIOLOGICAL RESOURCES REPORT
FOR THE
BUSK PROPERTY
1390 E. DUNNE AVENUE
MORGAN HILL, CA

BY
MOSAIC ASSOCIATES LLC
OCTOBER, 2015

BIOLOGICAL RESOURCES REPORT FOR THE BUSK PROPERTY 1390 E. DUNNE AVENUE, MORGAN HILL, CA

October 2015

Prepared for:

Geier & Geier Consulting, Inc. P.O. Box 5054 Berkeley, CA 94705

Prepared by:



Mosaic Associates LLC 1690 San Pablo Avenue, Suite D Pinole, CA 94564

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1.0 Introduction

This report contains the findings of a biological resources assessment for the approximately 3.6-acre Busk property (Study Area) located southeast of the intersection of E. Dunne and Murphy Avenues in Morgan Hill, CA (Figure 1). Residential development has been proposed on the property, including the development of 12 new homes and the retention of two existing homes (Figure 2).

The purpose of this biological resources report is to characterize the habitats that are present within the Study Area, evaluate the impact of the project on biological resources, describe mitigation measures to reduce potential impacts of the Project on biological resources, and make recommendations on the need for further surveys prior to development. This report was prepared in support of the environmental review of the project by the City of Morgan Hill under a contract with Geier & Geier Consulting, Inc.

2.0 Project Description

The Project consists of the development of 12 new residences, retention of the two existing homes that are present within the Study Area and the construction of streets, landscaping and other amenities on the approximately 3.6-acre property. Three existing outbuildings, as well as most of the existing vegetation on the property will be demolished.

3.0 Regulatory Background

The following sections describe the relevant regulatory context for this biological resources assessment, including applicable laws and regulations that were applied to the field investigation and the analysis of potential impacts of the project on biological resources.

3.1 Special-Status Species

Special-status species include those plant and wildlife species that have been formally listed, are proposed as endangered or threatened, or are candidates for such listing under the federal Endangered Species Act (ESA) or California Endangered Species Act (CESA). These acts afford protection to both listed and proposed species. In addition, California Department of Fish and Wildlife (CDFW) Species of Special Concern, which are species that face extirpation in California if current population and habitat trends continue, U.S. Fish and Wildlife Service (USFWS) Birds of Conservation Concern, sensitive species included in USFWS Recovery Plans, and CDFW special-status invertebrates are all considered special-status species. Although CDFW Species of Special Concern generally have no special legal status, they are given special consideration under CEQA. In addition to regulations for special status-species, most birds in the United States, including non-status species, are protected by the Migratory Bird Treaty Act of 1918. Under this legislation, destroying active nests, eggs, and young is illegal. Plant species on California Native Plant Society (CNPS) Lists 1 and 2 are also considered special status plant species and must be considered under CEQA.

3.2 Special-Status Natural Communities

Special-status natural communities are those that are considered rare in the region, support special-status plant or wildlife species, or receive regulatory protection (*i.e.*, Section 404 and 401 of the Clean Water Act, the CDFW Section1600 *et seq.* of the California Fish and Game Code, and/or the Porter-Cologne Act). In addition, the California Natural Diversity Data Base (CNDDB) has designated a number of communities as rare; these communities are given the highest inventory priority (Holland 1986, CNPS 2011). As no special-status natural communities are present within the study area, no further consideration to such communities is given in this report.

3.3 Relevant Local Policies, Ordinances, Regulations

Tree Ordinance. The City of Morgan Hill has a tree ordinance (Chapter 12.32 of the City's municipal code) which seeks to protect all trees having a single stem or trunk with a circumference of forty inches or greater for nonindigenous species (except those in residential zones) and eighteen inches or greater for indigenous species measured at four and one-half feet vertically above the ground or immediately below the lowest branch. Indigenous trees are defined by the City as any tree that is native to the Morgan Hill region, including oaks (all types), California bays, madrones, sycamore and alder. The ordinance states that "it is unlawful for any person to cut down, remove, poison or otherwise kill or destroy, or cause to be removed any tree or community of trees on any city or private property without first securing a permit as provided in this chapter; provided, however, that a permit shall not be required for developments which have been reviewed and approved by the planning commission or architectural and site review board and the tree removal conforms with the landscape plans of those developments." A tree permit will be needed prior to the removal of protected trees within the Study Area.

Citywide Burrowing Owl Habitat Mitigation Plan (Owl Plan). Since 2003, the City of Morgan Hill's Owl Plan has provided a mechanism to conserve suitable burrowing owl habitat by assessing a fee on all new development within the City. This system spreads owl mitigation costs across development projects with the philosophy that owls are impacted by the loss in foraging habitat and potential breeding habitat, not just active breeding habitat. Therefore, every new development project in Morgan Hill is subject to a burrowing owl fee. This fee is levied on residential development per dwelling unit and on commercial/industrial development per acre. The fee for residential development is collected at the time of recordation of the subdivision map. The fee for commercial/industrial development is collected at the time of building permit issuance.

3.4 Santa Clara Valley Habitat Plan

The Santa Clara Valley Habitat Plan (SCVHP) was implemented in 2013. Six local partners (the County of Santa Clara, Santa Clara Valley Transportation Authority; Santa Clara Valley Water District, and the Cities of San Jose, Gilroy, and Morgan Hill) and two wildlife agencies (the California Department of Fish and Wildlife and the U.S. Fish and Wildlife Service) prepared and adopted this multispecies habitat conservation plan, which primarily covers southern Santa Clara

County, as well as the City of San Jose with the exception of the bayland areas. The SCVHP addresses conservation of listed species and species that are likely to become listed during the plan's 50-year permit term. The eighteen covered species include nine plants and nine animals, including the western burrowing owl and the California tiger salamander. In general, the SCVHP is a fee based program aimed at providing for the regional conservation of these species.

The Study Area is within the SCVHP permit area, and urban development is a "Covered Activity" under the plan. Land cover in the Study Area is classified as Urban – Suburban. No SCVHP land cover fees apply to the Project given its location in a "No Land Cover Fee" zone.

4.0 Methods and Limitations

The findings in this report are based upon a reconnaissance-level survey of the Study Area conducted by Judy Bendix of Mosaic Associates on September 23, 2015. The Study Area was surveyed on foot during daylight hours. Plant and animal species detected during the site visit were noted and are described below. Surrounding lands were scanned with binoculars but were not physically surveyed.

Additional sources of information used for the analysis included the Natural Resource Conservation Service's Soil Survey of Eastern Santa Clara Area, California (2014), the California Natural Diversity Data Base (CDFW 2015), The City of Morgan Hill's Citywide Burrowing Owl Habitat Mitigation Plan (2003), special-status species lists prepared by CDFW and the USFWS, the SCVHP, and manuals and references related to plants and animals found in and around Santa Clara County.

The assessment of impacts on biological resources in the Study Area are based on development of the site as featured on Figure 2.

5.0 Existing Conditions

5.1 Setting

The Study Area (APN 817-19-044) is located at 1390 E. Dunne Avenue in Morgan Hill, east of Highway 101. Surrounding land use includes commercial development, a City park and an elementary school to the north, residential development is to the east, a church to the south and a fallow agricultural field to the west. The site is essentially flat, with elevations between 358 and 362 feet above mean sea level.

Two residences are present within the Study Area. The original farmhouse is located south of the intersection of E. Dunne and Murphy Avenues. Three outbuildings south of the farmhouse are also present, including a two-story shed, and a barn and a garage/workshop.

The second house, which is younger than the farmhouse is located near the center of the property. Landscaping and a vegetable garden, piles of woody debris, and other refuse is also present on the property.

Remnants of an old walnut orchard are present to the east of the second house. Numerous trees are present within the Study Area. As noted in the Arborist Report (M. Smith, 4/11/15), most of the trees on the property are between 40 and 60 years old. Many of the trees are dead or in poor health, and are poorly maintained. Portions of the property have been disked to abate fire hazard, including a strip along the southern boundary of the site and in the old orchard on the east side of the property.

5.2 Habitats

The Study Area consists of existing low-density residential development with outbuildings, landscaping and remnants of an old orchard. Much of the site supports a relatively dense overstory of mature trees including the native coast live oak (*Quercus agrifolia*), as well as planted horticultural species such as Monterey pine (*Pinus radiata*), black walnut (*Juglans nigra*), California pepper (*Schinus molle*), loquat (*Eriobotrya* sp.), dwarf blue gum (*Eucalyptus globulus* var. *compacta*), Bailey acacia (*Acacia baileyana*), palms (Arecaceae), deodar cedar (*Cedrus deodara*), incense cedar (*Calocedrus decurrens*), Italian stone pine (*Pinus pinea*), olive (*Olea europaea*), and Douglas fir (*Pseudotsuga menziesii*). Horticultural shrubs surround the residences. Outside of the landscaped yards and disked areas, ruderal vegetation dominates the understory. Non-native grasses wild oat (*Avena fatua*) and ripgut brome (*Bromus diandrus*) as well as non-native forbs including yellow star thistle (*Centauria solstitialis*), field bindweed (*Convolvulus arvensis*), milk thistle (*Silybum marianum*), shortpod mustard (*Hirschfeldia incana*), black mustard (*Brassica nigra*), and common mallow (*Malva neglecta*). These species are common constituents of disturbed settings. The only native plants found in the understory were coast live oak seedlings and a few narrowleaf milkweed (*Asclepias fasicularis*).

No wetlands, streams or riparian habitat is present in or adjacent to the Study Area.

Birds observed in or flying over the site include Anna's hummingbird (*Calypte anna*), mourning dove (*Zenaida macroura*), California towhee (*Pipilo crissalis*), scrub jay (*Aphelocoma californica*), oak titmouse (*Baeolophus inornatus*), black phoebe (*Sayornis nigricans*), and turkey vulture (*Cathartes aura*). A non-native eastern fox squirrel (*Sciurus niger*) was observed on site. No ground squirrels (*Spermophilus beecheyi*) were observed although a few ground squirrel burrows were present in the northern corner of the site abutting E. Dunne Avenue.

5.3 Soils

Soils in the Study Area consist of Arbuckle gravelly loam, 0 to 2 percent slopes. This soil is well drained, and is classified as Prime farmland if irrigated.

6.0 Special-status Species and Natural Communities

A search of published accounts for special-status plant and animal species was conducted for the Morgan Hill USGS 7.5" quadrangle in which the project site occurs and for the eight

surrounding quadrangles (San Jose East, Lick Observatory, Isabel Valley, Santa Teresa Hills, Mt. Sizer, Loma Prieta, Mt. Madonna, and Gilroy) using the CNDDB Rarefind 5 application (CDFW 2015). Figure 3 shows the locations of special-status species within 3.1 miles of the Study Area. Of the 71 special status plant and animal species recorded from the region, only three have any potential to occur within the Study Area. Special-status species with potential to occur on the Study Area include burrowing owl (*Athene cunicularia*), pallid bat (*Antrozous pallidus*) and Yuma myotis (*Myotis yumanensis*). Additional information on those species is provided below. Given the conversion of the Study Area to residential use many decades ago, as well as continued disturbance from the existing residences and outbuildings, landscaping and use for agriculture (former orchard), there is no suitable habitat present for the other 68 species known from the region, and they are not considered further in this report.

6.1 Special-Status Plants

No special-status plants have potential to occur within the Study Area. Suitable habitat for special-status plants is absent due to the thoroughly disturbed condition of the site resulting from decades of residential and agricultural disturbance.

6.2 Special-Status Wildlife

Special-status wildlife with potential to be present in the Study Area include: burrowing owl, pallid bat and Yuma myotis. Habitat for other special-status wildlife known from the region surrounding the project site is absent due to past conversion of the site to residential and agricultural use.

Western Burrowing Owl

Western burrowing owl (California Species of Special Concern) requires habitat with open, well-drained terrain, sparse vegetation, and underground burrows available for use throughout their entire life cycle (Klute et al. 2003). The birds most commonly live in burrows created by California ground squirrels. Burrowing owls feed opportunistically on arthropods, small mammals, birds, amphibians, and reptiles.

The CNDDB contains no records of burrowing owls in Morgan Hill over the past decade (CNDDB 2015). Historical sightings of burrowing owls in Morgan Hill include an observation of an owl using an artificial burrow at El Toro Elementary School in March 2003. Owls were previously observed on this same site in 1998, 2000, and 2001. Indirect evidence of burrowing owls (e.g., whitewash, feathers, and pellets) was observed approximately 0.4 miles northeast of near the intersection of Edmundson and Sunnyside Avenues in August 2002. No burrowing owls have been observed on that site since.

The site does not occur within modeled occupied habitat as shown on Figure 5-11 of the SCVHP, nor does it occur within the SCVHP-defined Burrowing Owl Survey and Fee Zone.

A few ground squirrel burrows were observed in the northwest corner of the property adjacent to E. Dunne Avenue. No burrowing owls or evidence of burrowing owl occupancy (e.g. whitewash, feathers, or pellets) were observed, and their location in an area of tall dense vegetation makes it

highly unlikely that burrowing owls would use these burrows. Nevertheless, suitable burrows are present within the Study Area.

Pallid Bat and Yuma Myotis

Pallid bat (California Species of Special Concern) is found in grasslands, chaparral, woodlands, and forests of California. It is most common in open, dry habitats with rocky areas for roosting. Day and night roosts include crevices in rocky outcrops and cliffs, caves, mines, trees (e.g., basal hollows of coast redwoods and giant sequoias, bole cavities of oaks, exfoliating Ponderosa pine and valley oak bark, deciduous trees in riparian areas, and fruit trees in orchards), and various human structures such as bridges (especially wooden and concrete girder designs), barns, porches, bat boxes, and human-occupied as well as vacant buildings. They forage over open shrub-steppe grasslands, oak savannah grasslands, open Ponderosa pine forests, talus slopes, gravel roads, lava flows, fruit orchards, and vineyards. Roosts must protect bats from high temperatures. Pallid bats are very sensitive to disturbance of roosting sites.

Yuma myotis (Western Bat Working Group Low Priority) occurs in a variety of low elevation habitats including riparian, arid scrublands and deserts, and forests. Day roosts are found in buildings, trees, mines, caves, bridges and rock crevices. Night roots are usually associated with buildings, bridges or other man-made structures (Philpott 1996).

Although none of the pallid bat or Yuma myotis occurrences in the CNDDB from the nine-quad area surrounding the project are in Morgan Hill, both bats are known from the region (CDFW 2015). The outbuildings on site may provide suitable roosting habitat for pallid bats and Yuma myotis. A cursory inspection of the garage/workshed and barn revealed no evidence of guano, but the two-story shed next to the old farmhouse was not inspected due to concerns about safe access.

7.0 POTENTIAL IMPACTS AND MITIGATION MEASURES

Impacts of the Project and suggested avoidance, minimization and mitigation measures are listed below. Impacts would be rendered less-than-significant with implementation of the mitigation measures described below.

7.1 Special-Status Animals and Native Wildlife

Burrowing Owl

Potential Impacts

Burrowing owl may forage in the open field west of the project site and has a very low potential to occupy the small mammal burrows in the northwest corner of the site adjacent to E. Dunne Avenue. Development of the site has the potential to affect individuals if present, and result in a small loss of underground habitat.

Mitigation Measure

Project construction should conform to the requirements described in the Citywide Burrowing Owl Habitat Mitigation Plan (Plan) for the City of Morgan Hill (2003). Requirements include,

but are not limited to, a pre-construction survey by a qualified biologist to determine the presence or absence of burrowing owl habitat within the Study Area. The pre-construction survey must be conducted within 30 days of ground disturbance within any potential owl habitat. If burrows are observed, a qualified biologist must conduct four surveys on different dates to census the owl population on-site. Locations of active burrows would be mapped, and burrowing owls inhabiting these burrows should be evicted within seven days of ground disturbance according to protocol described in the Plan. Eviction shall only take place during the non-breeding season (September I through January 31), and a written report of survey and eviction results would be submitted to the Department of Planning. If no burrows are observed on-site, or if owls are absent during all four census surveys, a written report describing survey results shall be submitted to the City Of Morgan Hill Department of Planning, and ground-breaking activities may commence no more than 30 days after the completion of Burrowing Owl surveys.

Pallid Bat and Yuma Myotis

Potential Impacts

Pallid bat and Yuma myotis have potential to occur within the project site. The outbuildings within the Study Area as well as some of the larger trees may be inhabited by these bats during the breeding and hibernation seasons (November through mid-August). Removal of occupied trees and structures may impact one or both of these species.

Mitigation Measure

If tree and building removal is conducted in late August through October, no additional measures are required.

For tree or building removal from November through mid-August, pre-construction surveys of trees and structures proposed for removal shall be conducted by a qualified wildlife biologist. Surveys will occur no more than 30 days prior to the initiation of demolition or tree removal. The wildlife biologist shall examine trees and structures for urine staining and fecal pellets. If signs of the presence of bats are detected, the wildlife biologist will determine whether the bats are presently occupying the tree or buildings and whether the colony is breeding. The wildlife biologist will then work with the contractor to exclude the colony from the trees at an appropriate time when the bats are not engaged in breeding or hibernation activities.

Nesting Raptors and Other Migratory Birds

Potential Impacts

Trees and structures on the project site provide suitable nesting habitat for nesting raptors such as red-tailed hawk and other avian species. Removal of trees, shrubs and the outbuildings has potential to cause the failure or abandonment of active nests.

Mitigation Measure

Pre-construction surveys for nesting birds shall be conducted by a qualified biologist not more than two weeks prior to site disturbance during the breeding season (February 1 through August 31). If site disturbance commences outside the nesting season, pre-construction surveys for nesting birds are not required. If active nests of raptors and other migratory birds are not detected

within approximately 250 feet of the project site, no further mitigation is required. If nesting raptors or other migratory birds are detected on or adjacent to the site during the survey, a suitable construction-free buffer should be established around all active nests. The dimensions of the buffer (up to 250 feet) should be determined at that time and may vary depending on location and species. The buffer areas should be enclosed with temporary fencing, and construction equipment and workers should not enter the enclosed setback areas. Buffers should remain in place for the duration of the breeding season or until it has been confirmed by a qualified biologist that all chicks have fledged and are independent of their parents.

8.0 References

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- Smith, M. 2015. Arborist Report. April 11.

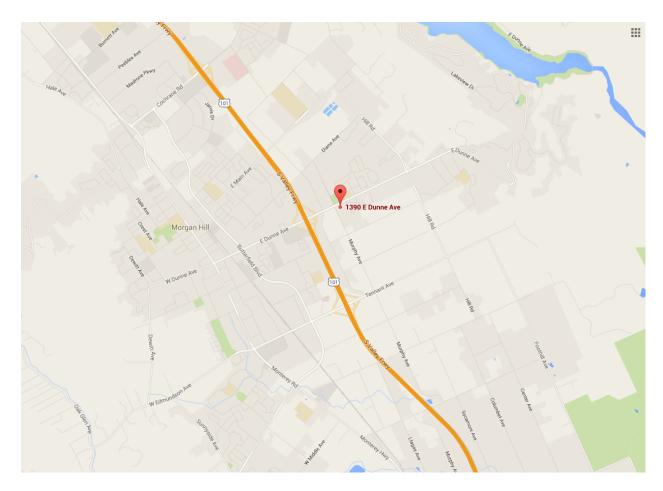


Figure 1. Vicinity map for the Busk Study Area.

ATTACHMENT 4

ARBORIST REPORT FOR EAST DUNNE AVENUE X MURPHY AVENUE, MORGAN HILL BUSK PROPERTY

BY
MORGAN HILL TREE SERVICE
APRIL 11, 2015

Scott Murray	April 11, 2015
Intero Realty	Original:
175 E. Main Ave	Property: Murphy Ave X E. Dunne Ave Morgan Hill
Morgan Hill, CA 95037	Busk Property
408-406-6000	APN #

As per your request we visited the property shown above in order to catalog trees as well as make observations and recommendations regarding the condition of trees on site or those located near the lot lines.

The exact location of trees is not known as they have not yet been surveyed.

The primary scope of this report is the portion of the project that includes the inventory, cataloging and marking on the map provided the trees on site.

We observed that most of the trees at this site were between 40 and 60 years old. It appears that very little maintenance has been performed on the trees over the years since the lot was first developed. Consequently most of the trees have developed structural and health problems that would make preservation difficult and costly.

Construction site tree preservation recommendations sheet is included in this report and is intended to provide guidelines for preservation of all trees that are to be retained in the construction.

All grading, trenching or other construction falling within 5' outside drip line and / or protective fencing should be supervised by an arborist in order to ensure proper care is taken for preservation. Any roots effected or damaged over 2" diameter should be clean cut and treated with fungicide by qualified arboricultural personnel.

Please feel free to call for further clarification.

Respectfully submitted, Moki Smith Arborist #WE-6620A

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
1	5619	Coast live oak	Quercus agrifolia	14"	25'	16′	Poor

Observations:

This tree has poor structure with an extreme incline.

There is included bark in the first main crotch.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
2	5620	California pepper	Schinus molle	26"	33'	22'	Poor

Observations:

This tree has a cavity in the main stem and a large wound in the North heading main up right.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
3	5621	Incense cedar	Calocedrus decurrens	7"	16'	12'	Fair

Observations:

This tree is in fair condition with no visible structural problems, pest or other infestation.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tree	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
4	5622	Loquat	Eriobotrya sp.	16"	16'	18'	Poor

Observations:

This tree has a multi leader main stem with 6 main uprights.

The tree has poor structure with included bark in the first main crotch.

Recommendations:

Pending construction specifications.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
5	5623	Black walnut	Juglans nigra	12"	18'	19'	Poor

Observations:

This tree has poor structure.

This tree may be presenting a toxic effect on other surrounding plant material.

See explanations attached.

Recommendations:

Remove to protect surrounding plant material.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
6	5624	Black walnut	Juglans nigra	13"	21'	20'	Poor

Observations:

This tree has poor structure.

This tree may be presenting a toxic effect on other surrounding plant material.

See explanations attached.

Recommendations:

Remove to protect surrounding plant material.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
7	5625	Coast live oak	Quercus agrifolia	6.5"	13'	8'	Fair

Observations:

This tree is in fair condition with no visible structural problems, pest or other infestation.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
8	5626	Coast live oak	Quercus agrifolia	16"	27'	16'	Poor

Observations:

This tree has poor structure with included bark.

This tree is not included on the print provided.

Recommendations:

Pending construction specifications.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
9	5627	Dwarf blue gum	Compacta eucalyptus	33"	26'	21'	Fair
			globulus				

Observations:

This tree has a multi leader main stem with 9 main uprights.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
10	5628	Bailey acacia	Acacia baileyana	18"	38'	21'	Poor

Observations:

This tree has poor structure with an extreme incline.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
11	5629	California pepper	Schinus molle	16"	32'	31'	Fair

Observations:

This tree is in fair condition with no visible structural problems, pest or other infestation.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
12	5630	Palm	Arecaceae	14"	63'	10'	Good

Observations:

This tree is in good condition with no visible structural problems, pest or other infestation.

Recommendations:

Pending construction specifications.

Tree	# Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
13	5631	Palm	Arecaceae	14"	51'	10'	Good

Observations:

This tree is in good condition with no visible structural problems, pest or other infestation.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
14	5632	Coast live oak	Quercus agrifolia	28"	37'	42'	Good

Observations:

This tree is in good condition with no visible structural problems, pest or other infestation.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
15	5633	Coast live oak	Quercus agrifolia	20"	26'	32'	Good

Observations:

This tree is in good condition with no visible structural problems, pest or other infestation.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
16	5634	Coast live oak	Quercus agrifolia	11"	22'	16′	Fair

Observations:

This tree is in fair condition with no visible structural problems, pest or other infestation.

This tree not accessible and the tag for this tree was placed on the North side of the adjacent fence for reference.

Recommendations:

Pending construction specifications.

Т	ree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
	17	5635	Deodar cedar	Cedrus deodara	6"	20'	12'	Fair

Observations:

This tree is in fair condition with no visible structural problems, pest or other infestation.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
18	5636	Deodar cedar	Cedrus deodara	6"	19'	13'	Fair

Observations:

This tree is in fair condition with no visible structural problems, pest or other infestation.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
19	5637	Monterey pine	Pinus radiata	23"	37'	33'	Poor

Observations:

This tree is in poor condition, however may be retained.

This tree not accessible and the tag for this tree was placed on the adjacent fence for reference.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
20	5638	Coast live oak	Quercus agrifolia	16"	11'	14'	Fair

Observations:

This tree in fair condition with a multi leader main stem with 3 main uprights.

Recommendations:

Pending construction specifications.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
21	5639	Monterey pine	Pinus radiata	16"	21'	27'	Poor

Observations:

This tree not accessible and the tag for this tree was placed on the adjacent fence for reference.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
22	5640	Italian stone pine	Pinus pinea	55"	53'	31'	Fair

Observations:

This tree is in fair condition with no visible structural problems, pest or other infestation.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
23	5641	Olive	Olea europaea	60"	20'	26'	Poor

Observations:

This tree has a multi leader main stem with 10 main uprights.

The tree has poor structure with included bark.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
24	5642	Coast live oak	Quercus agrifolia	7"	13'	8'	Fair

Observations:

This tree is in fair condition with no visible structural problems, pest or other infestation.

Recommendations:

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
25	5643	Monterey pine	Pinus radiata	20"	18'	24'	Poor

Observations:

This tree is in poor condition with a beetle infestation.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tı	ree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
2	26	5644	Douglas fir	Pseudotsuga menziesii	35"	28'	16'	Fair

Observations:

This tree in fair condition with a multi leader main stem with 2 main uprights.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
27	5645	Coast live oak	Quercus agrifolia	7"	18'	9'	Good

Observations:

This tree is in good condition with no visible structural problems, pest or other infestation.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
28	5646	Coast live oak	Quercus agrifolia	6.5"	16'	11'	Good

Observations:

This tree is in good condition with no visible structural problems, pest or other infestation.

Recommendations:

Pending construction specifications.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
29	5647	Italian stone pine	Pinus pinea	28"	33'	31'	Poor

Observations:

There is a large wound near the base of this tree presenting a possible main stem failure.

Recommendations:

Remove for safety.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
30	5648	Italian stone pine	Pinus pinea	32"	47'	41'	Poor

Observations:

This tree is leaning toward the house and presenting a property damage hazard.

Recommendations:

Remove for safety.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
31	5649	Italian stone pine	Pinus pinea	24"	29'	26'	Poor

Observations:

This tree is leaning toward the house and presenting a property damage hazard.

Recommendations:

Remove for safety.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
32	5650	Monterey pine	Pinus radiata	30"	47'	31'	Poor

Observations:

This tree is leaning toward the house on the adjacent property and presenting a property damage hazard.

Recommendations:

Remove for safety.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
33	5651	Monterey pine	Pinus radiata	13"	26'	19'	Poor

Observations:

This tree is showing signs of severe stress.

Recommendations:

Remove for safety.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
34	5652	Italian stone pine	Pinus pinea	17"	33'	32'	Fair

Observations:

This tree is leaning approximately 30°.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
35	5653	Blue Gum	Eucalyptus globulus	11"	22'	20'	Good

Observations:

This tree is leaning toward the house and presenting a property damage hazard.

Recommendations:

Remove for safety.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
36	5654	Monterey pine	Pinus radiata	19"	38'	20'	Poor

Observations:

This tree is showing signs of severe stress and beetle infestation.

Recommendations:

Remove for safety.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
37	5655	Italian stone pine	Pinus pinea	33"	41'	42'	Poor

Observations:

This tree is leaning and has a cavity in the main stem.

Recommendations:

Remove for safety.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
38	5656	Italian stone pine	Pinus pinea	43"	48'	43'	Poor

Observations:

This tree is leaning severely and off balance due to excessive pruning with signs of heaving in the soil and is showing signs of an uprooting failure.

Recommendations:

Remove for safety.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
39	5657	Italian stone pine	Pinus pinea	36"	38'	43'	Poor

Observations:

This tree is leaning severely and has had a large main lateral limb failure.

Recommendations:

Remove for safety.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
40	5658	Douglas fir	Pseudotsuga menziesii	13"	21'	11'	Fair

Observations:

This tree is leaning toward the house and presenting a property damage hazard.

Recommendations:

Remove for safety.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
41	5659	Monterey pine	Pinus radiata	30"	31'	27'	Poor

Observations:

This tree has a multi leader main stem with 2 main uprights.

The tree has poor structure with included bark.

Recommendations:

Pending construction specifications.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
42	5660	Deodar cedar	Cedrus deodara	36"	24'	20'	Fair

Observations:

This tree is in fair a multi leader main stem with 3 main uprights.

Recommendations:

Pending construction specifications.

If retained, perform all construction site preservation measures as outlined.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
43	5661	Monterey pine	Pinus radiata	26"	27'	22'	Fair

Observations:

This tree has a multi leader main stem with 2 main uprights.

The tree has poor structure with included bark.

Recommendations:

Remove for safety.

Tree#	Tag#	CommonName	Species	D.B.H.	Height	Canopy Spread	Condition
44	5662	English walnut	Juglans regia	12"	16'	24'	Fair

Observations:

This tree is in fair condition with no visible structural problems, pest or other infestation.

Recommendations:

Construction Site - Tree Preservation

•	Locate structures,	grade changes,	, etc. as	far as f	easible fro	m the `	dripline'	area of	the
tı	ree.								

- Avoid root damage through grading, trenching, compaction, etc., at least within an area 1.5 times the `drip line' area of trees. Where root damage cannot be avoided, roots encountered (over 1" diameter) should be exposed approximately 12" beyond the area to be disturbed (towards tree stem), by hand excavation, or with specialized hydraulic or pneumatic
- equipment, cut cleanly with hand pruners or power saw, and immediately back-filled with soil. Avoid tearing, or otherwise disturbing that portion of the root(s) to remain.
- Construct a temporary fence as far from the tree stem (trunk) as possible, completely surrounding the tree, and 6-8 feet in height. Post no parking or storage signs outside / on fencing. Do not attach posting to the main stem of the tree.
- Do not allow vehicles, equipment, pedestrian traffic; building materials or debris storage; or disposal of toxic <u>or other</u> materials inside of the fenced off area.
- Avoid pruning immediately before, during, or immediately after construction impact. Perform only that pruning which is unavoidable due to conflicts with proposed development. Aesthetic pruning should not be performed for at least 1-2 years following completion of construction.
- Trees that will be impacted by construction may benefit from fertilization, ideally performed in the fall, and preferably prior to any construction activities, with not more than 6 lbs. of actual nitrogen per 1,000 square feet of accessible `drip line' area or beyond.
- Mulch `rooting' area with an acidic, organic compost or mulch.
- Arrange for periodic (Biannual/Quarterly) inspection of tree's condition, and treatment of damaging conditions (insects, diseases, nutrient deficiencies, etc.) as they occur, or as appropriate.
- Individual trees likely to suffer significant impacts may require specific, more extensive efforts and/or a more detailed specification than those contained within these general guidelines.

Walnut Trees and Your Garden - Effects of Juglone

by Don Janssen, Extension Educator

Since ancient times, scholars have suspected that walnuts have harmful effects on nearby plants. In the 1880s, scientists isolated a compound called juglone from the fruit of walnuts. They demonstrated that injury and sometimes death result when this phytotoxic material interacts with susceptible plants.

In addition to the fruit, juglone has also been found in the leaves, branches, and roots. The actual concentration in each part varies with the season. In spring, juglone is concentrated in the rapidly growing leaves. The amount of juglone in the roots remains relatively high throughout the summer. The concentration of juglone in the hulls of the fruit increases as the crop matures. All species of the walnut family produce juglone. Black walnuts have the highest concentrations. Relatively small amounts are found in butternut, hickory, and pecan. Most toxicity problems are caused by the black walnut.

The sources of juglone in the soil include both living and decaying plant material. Rain droplets leach juglone from the buds, leaves, and twigs. The decomposition of plant debris by soil microorganisms also releases juglone. Living roots exude juglone into the surrounding soil.

Vegetables susceptible to juglone include tomatoes, potatoes, peppers, and eggplants. Symptoms include reduced growth, wilting, and possibly death. The presence of large walnut trees near a vegetable garden subjects susceptible plants to double jeopardy. The presence of juglone in the soil, plus the competition for light, water and nutrients creates an extremely stressful environment. Fortunately, not all vegetables are injured by juglone. Corn, beans, onions, beets, and carrots are tolerant of juglone. If the garden plot receives sufficient sunlight, gardeners should be able to successfully grow these crops with timely applications of water and fertilizer.

Gardeners should plant shade tolerant annuals and perennials, such as impatiens, hosta, and ferns, near large walnut trees. (A complete list of plants susceptible and tolerant of juglone is unavailable as little research has been done in the area.)

Gardeners who have large walnut trees near their vegetable gardens should consider alternate sites. The greatest concentration of juglone in the soil exists within the drip line of the trees. Vegetable gardens in this area will undoubtedly experience problems. Plants susceptible to juglone are occasionally damaged well beyond the drip line as the roots of walnuts may extend 2 to 3 times the crown radius (the distance from the trunk to the drip line).

Volunteer walnut seedlings which appear in or near the garden should be removed. Walnut leaves and other plant debris, which may accumulate in the garden, should be raked and removed. Sawdust or wood chips derived from walnuts should not be applied as a mulch around susceptible plants.

Black walnuts can create problems for home gardeners. Careful selection of juglone tolerant vegetables and shade tolerant annuals and perennials should help overcome these problems.





#5619

#5620





#5620 – Large wound in North heading main upright.





#5626 - Shows entire tree

#5627





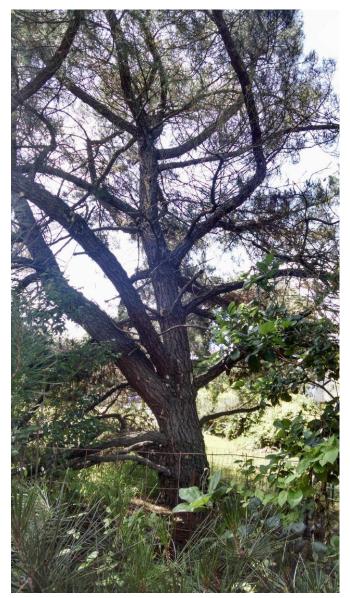
#5633 #5634

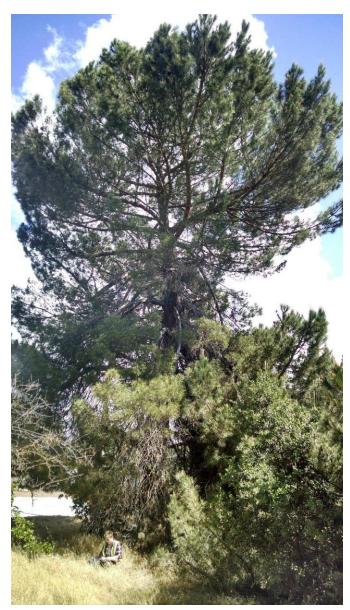


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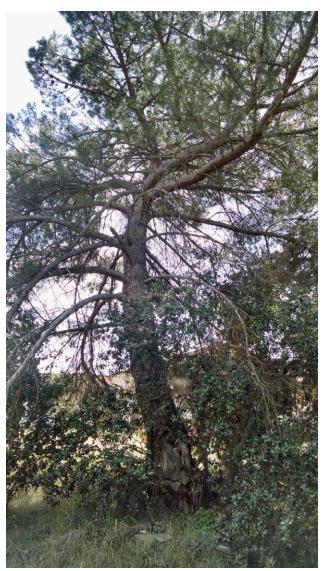


#5638





#5639 #5640







#5647 - Large wound in main stem.



Pine trees that have die and failed - not tagged. This is typical of many of the tree on site.

ATTACHMENT 5

NOISE ASSESSMENT STUDY

FOR THE

PLANNED "BUSK PROPERTY"

SINGLE-FAMILY SUBDIVISION

EAST DUNNE AVENUE

MORGAN HILL

BY
EDWARD L. PACK ASSOCIATES, INC.
OCTOBER 15, 2015

EDWARD L. PACK ASSOCIATES. INC.



1975 HAMILTON AVENUE SUITE 26 SAN JOSE, CA 95125

Acoustical Consultants

TEL: 408-371-1195 FAX: 408-371-1196 www.packassociates.com

October 15, 2015 Project No. 47-065

Mr. Frederick Geier Geier & Geier Consulting, Inc. P.O. Box 5054 Berkeley, CA 94705

Subject: Noise Assessment Study for the Planned "Busk Property"

Single-Family Subdivision, East Dunne Avenue, Morgan Hill

Dear Mr. Geier:

This report presents the results of a noise assessment study for the planned "Busk Property" single-family subdivision along East Dunne Avenue and Murphy Avenue in Morgan Hill, as shown on the Preliminary Grading Plan, Ref. (a). The noise exposures at the site were evaluated against the standards of the City of Morgan Hill General Plan Noise Element, Ref. (b). An analysis of the on-site noise the measurements indicates that the noise environment is created primarily by traffic sources on East Dunne Avenue, Murphy Avenue and Highway 101. The results of the analysis reveal that exterior noise exposure excesses will occur. The interior noise exposures will be within the limits of the City of Morgan Hill Noise Element standards. However, interior maximum noise levels will exceed the limits of the City of Morgan Hill Noise Element standards. Mitigation measures will be required.

Sections I and II of this report contain a summary of our findings and recommendations, respectively. Subsequent sections contain site, traffic and project descriptions, analyses and evaluations. Appendices A, B and C, attached, contain the list of references, descriptions of the standards, definitions of the terminology, descriptions of the instrumentation used for the field survey, and the on-site noise measurement data and calculation tables.

I. Summary of the Findings

A. Noise Standards and Criteria

City of Morgan Hill Noise Element

The noise <u>exposures</u> presented herein were evaluated against the standards of the City of Morgan Hill Noise Element, which utilizes the Day-Night Level (DNL) 24-hour descriptor to define acceptable noise exposures for various land uses. The standards specify a limit of 60 decibels (dB) DNL at single-family exterior living areas.

A limit of 45 dB DNL is specified for interior living spaces. In addition, the Noise Element specifies that when the exterior noise exposure is greater than 60 dB DNL, the *maximum instantaneous* noise levels shall not exceed 50 dBA in bedrooms and 55 dBA in other living spaces. This study applies the 55 dBA limit for living spaces to the daytime hours of 7:00 AM to 10:00 PM and the 50 dBA limit for bedrooms to the nighttime hours of 10:00 PM to 7:00 AM. This study also arithmetically averages the nighttime L_{max} values for the evaluation against the 50 dBA L_{max} limit for bedrooms and the daytime L_{max} values for the evaluation against the 55 dBA L_{max} limit for other living spaces. This methodology maintains the spirit of evaluating high short-term noise, but does not preclude development or place onerous restrictions on a project due to a spurious noise event.

B. Exterior Noise Exposures and Noise Levels

The noise exposures shown below are without the application of mitigation measures and represent the noise environment for project conditions.

- The existing exterior noise exposure at the most impacted planned lot line along East Dunne Avenue, 62 ft. from the centerline of the road, is 66 dB DNL. Under future traffic conditions, the noise exposure is expected to increase to 67 dB DNL. Thus, the noise exposures will be up to 7 dB in excess of the City of Morgan Hill Noise Element standards.
- The existing exterior noise exposure at the most impacted planned building setback from East Dunne Avenue, 68 ft. from the centerline of the road, is 65 dB DNL. Under future traffic conditions, the noise exposure is expected to increase to 66 dB DNL. As the exterior noise exposures exceed 60 dB DNL, the interior maximum noise limits are applicable.
- The existing noise exposure at the least impacted lot line along Murphy Avenue, 56 ft. from the centerline, is 62 dB DNL. Of this 62 dB, 58 dB is due to Murphy Avenue traffic, 58 dB is due to Highway 101 traffic and 56 dB is due to East Dunne Avenue traffic. Under future traffic conditions, the noise exposure is expected to increase to 64 dB DNL, with 59 dB due to Murphy Avenue traffic, 60 dB due to Highway 101 traffic and 57 dB due to East Dunne Avenue traffic. Thus, the noise exposures will be up to 4 dB in excess of the 60 dB DNL limit of the City of Morgan Hill Noise Element standards.

• The existing exterior noise exposure at the most impacted planned building setback from Murphy Avenue is 61 dB DNL, with 57 dB due to Murphy Avenue traffic, 58 dB due to Highway 101 traffic and 53 dB due to East Dunne Avenue traffic. Under future traffic conditions, the noise exposure is expected to increase to 63 dB DNL, with 58 dB due to Murphy Avenue traffic, 60 dB due to Highway 101 traffic and 54 dB due to East Dunne Avenue traffic.

The future 60 dB DNL noise contour will be 175 ft. from the centerline of East Dunne Avenue and 180 ft. from the centerline of Murphy Avenue.

- The existing exterior $\underline{\text{maximum}}$ noise levels at the most impacted planned building setback from East Dunne Avenue range from 78.4 to 90.5 dBA L_{max} during the daytime and from 72.6 to 84.0 dBA L_{max} at night. The daytime average is 83.4 dBA L_{max} and the nighttime average is 78.0 dBA L_{max} .
- The existing exterior <u>maximum</u> noise levels at the most impacted planned building setback from Murphy Avenue range from 70.5 to 92.9 dBA L_{max} during the daytime and from 67.0 to 78.1 dBA L_{max} at night. The daytime average is 79.1 dBA L_{max} and the nighttime average is 71.6 dBA L_{max}.

The exterior noise exposures exceed the limits of the standards. Noise mitigation measures will be required. The recommended measures are described in Section II of this report.

C. <u>Interior Noise Exposures and Noise Levels</u>

 The interior noise exposures in the most impacted living spaces closest to East Dunne Avenue will be up to 40 and 41 dB DNL under existing and future traffic conditions, respectively. Thus, the noise exposures will be within the 45 dB DNL limit of the City of Morgan Hill Noise Element standards.

- The interior noise exposures at the most impacted living spaces closest to Murphy Avenue will be up to 36 and 38 dB DNL under existing and future traffic conditions, respectively. Thus, the noise exposures will be within the 45 dB DNL limit of the City of Morgan Hill Noise Element standards.
- The interior daytime <u>maximum</u> noise levels in the most impacted living spaces along East Dunne Avenue will range from 53.4 to 65.5 dBA L_{max}, with an average of 58.4 dBA L_{max}. Thus, the average interior maximum noise level will be up to 3 dB in excess of the 55 dBA daytime L_{max} limit for living spaces.
- The interior nighttime <u>maximum</u> noise levels in the most impacted bedrooms along East Dunne Avenue will range from 47.6 to 59.0 dBA L_{max}, with an average of 53.0 dBA L_{max}. Thus, the average interior maximum noise level will be up to 3 dB in excess of the 50 dBA nighttime L_{max} limit for bedrooms.
- The interior daytime <u>maximum</u> noise levels in the most impacted living spaces along Murphy Avenue will range from 45.5 to 67.9 dBA L_{max}, with an average of 54.1 dBA L_{max}. Thus, the average interior maximum noise level will be within the 55 dBA daytime L_{max} limit for living spaces.
- The interior nighttime <u>maximum</u> noise levels in the most impacted bedrooms along Murphy Avenue will range from 42.0 to 53.1 dBA L_{max}, with an average of 46.6 dBA L_{max}. Thus, the average interior maximum noise level will be within the 50 dBA nighttime L_{max} limit for bedrooms.

The interior noise exposures will be within the limits of the City of Morgan Hill Noise Element standards.

The interior maximum noise levels will exceed the limits of the standards in bedrooms and other living spaces in homes exposed to East Dunne Avenue traffic noise. Noise mitigation measures for certain interior spaces will be required. The recommended measures are described in Section II below.

D. Construction Noise Impacts

Short-term construction impacts may be created during construction of the development. Construction equipment generates noise levels in the range of 77 to 97 dBA at a 25 ft. distance from the source. Noise from construction equipment dissipates at the rate of 6 dB per doubling of the distance from the source to the receiver. At receptor locations adjacent to the east of the site, construction noise will be in the range of 77 to 97 dBA, which would result in noticeable noise conditions.

Since construction is carried out in several reasonably discrete phases, each has its own mix of equipment and consequently, its own noise characteristics. Generally, the site preparation requires the use of heavy equipment such as bulldozers, loaders, scrapers, and diesel trucks. Upon completion of the project, the area's sound levels will reduce essentially to the predicted traffic noise exposures analyzed in this study.

Over the course of a construction day, the noise exposure is expected to be up to 65 dB DNL at the most impacted residences adjacent to the east.

As construction noise is predicted to be significant to nearby residences, general mitigation measures are recommended to minimize the potential for annoyance. The recommended measures are described in Section II.

II. Recommendations

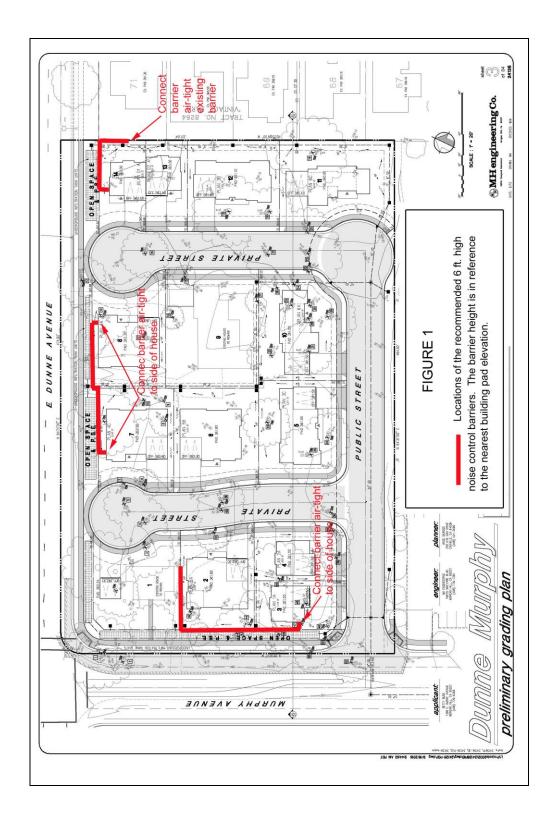
A. Exterior Noise Control

To achieve compliance with the 60 dB DNL limit of the City of Morgan Hill Noise Element standards for the noise impacted rear yards along East Dunne Avenue and Murphy Avenue, the following noise control barrier will be required.

• Construct 6 ft. high acoustically-effective barriers at the side and rear yards of Lots 2, 3, 7, 8 and 14. The barrier height is in reference to the nearest building pad elevation. To control flanking noise, turn the barriers at the fronts of the houses to connect airtight to the sides of the houses. In addition, connect the barrier behind Lot 14 to connect air-tight to the existing barrier along the easterly property line.

Please see Figure 1 for the location of the recommended noise control barrier.

To achieve an acoustically-effective barrier it must be constructed air-tight, i.e., without cracks, gaps or other openings, and must provide for long term durability. Barriers can be constructed of masonry, wood, concrete, stucco, earth berm or a combination thereof and must have a minimum surface weight of 2.5 lbs./sq. ft. If wood fencing is used, homogeneous sheet materials are preferable to conventional wood fencing as the latter has a tendency to warp and form openings with age. However, high quality air-tight tongue-and-groove, board and batten or shiplap construction can be used. All connections with posts, pilasters or building shells must be sealed air-tight. No openings are permitted between the upper barrier components and the ground. Gates may be incorporated into the barriers, however, they must meet the minimum surface weight requirement and must seal tight when closed. The gap at the bottom of the gate shall be less than 1".



B. <u>Interior Noise Control</u>

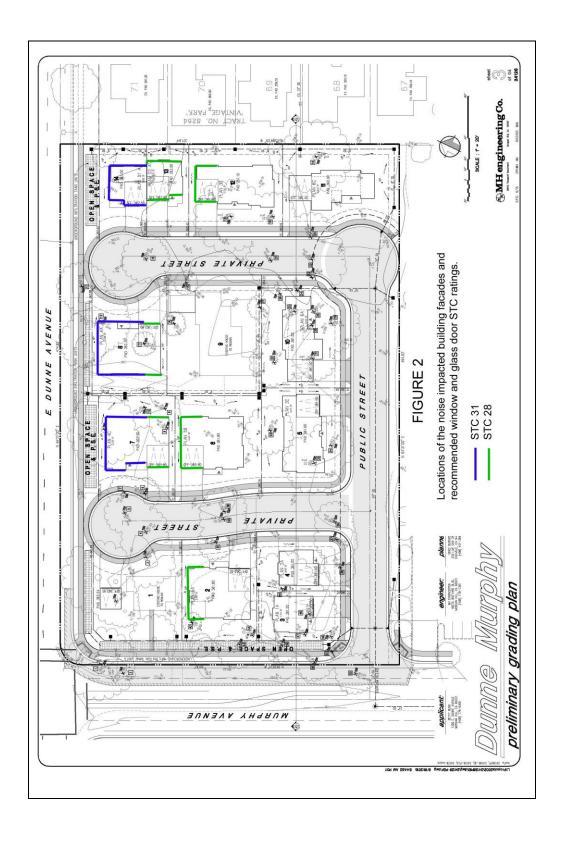
To achieve compliance with the $55~dBA~L_{max}$ limit for living spaces and the $50~dBA~L_{max}$ limit for bedrooms, the following window controls will be required. In addition, general building shell controls are also recommended and are described in Appendix B.

• Maintain closed at all times all second floor and unshielded first floor (a view to the road beyond a noise control barrier) bedroom and living space windows and glass doors within 190 ft. of the centerline of East Dunne Avenue and with a direct or side view to the roadway (west, north and east facades). At these spaces within 120 ft. of the centerline, install windows and glass doors rated minimum Sound Transmission Class (STC) 31. At the noise impacted spaces between 120 ft. and 190 ft. of the centerline, install windows and glass doors rated minimum STC 28.

Shielded facades include the first floors of the rear and side facades of Lots 6, 7, 8, 12, 13, and 14.

See Figure 2 for the locations of the noise impacted building facades and recommended STC ratings.

Some type of mechanical ventilation to assure a habitable environment must be provided, per the Mechanical Code. Noise control windows are to be operable, as the requirement does not imply a "fixed" condition. In addition to the required STC ratings, the windows and doors shall be installed in an acoustically-effective manner. To achieve an acoustically-effective window construction, the sliding window and door panels must form an air-tight seal to the outside environment when in the closed position and the window frames must be caulked to the wall opening around their entire perimeter with a non-hardening caulking compound to prevent sound infiltration. Exterior doors must seal air-tight around the full perimeter when in the closed position.



Please be aware that many dual-pane window and glass door assemblies have inherent noise reduction problems in the traffic noise frequency spectrum due to resonance that occurs within the air space between the window lites, and the noise reduction capabilities vary from manufacturer to manufacturer. Therefore, the acoustical test report of all sound rated windows should be reviewed by a qualified acoustician to ensure that the chosen windows will adequately reduce traffic noise to acceptable levels.

The implementation of the above recommended measures will reduce interior levels to 50 dBA L_{max} or lower in bedrooms and to 55 dBA L_{max} or lower in other living spaces.

C. <u>Construction Noise Mitigation</u>

Mitigation of the construction phase noise at the site can be accomplished by using quiet or "new technology" equipment. The greatest potential for noise abatement of current equipment should be the quieting of exhaust noises by use of improved mufflers. It is recommended that all internal combustion engines used at the project site be equipped with a type of muffler recommended by the vehicle manufacturer. In addition, all equipment should be in good mechanical condition so as to minimize noise created by faulty or poorly maintained engine, drive-train and other components. Construction noise can also be mitigated by the following:

- Scheduling noisy operations for the daytime hours of 7:00 AM to 8:00 PM Monday through Friday and from 9:00 AM to 6:00 PM Saturday, for compliance with the City of Morgan Hill Zoning Ordinance.
- All diesel powered equipment should be located more than 200 ft. from any residence if the equipment is to operate for more than several hours per day.
- Dirt berms and stockpiling materials can also help reduce noise to sensitive receptor locations.

As noise reduction benefit can also be achieved by appropriate selection of equipment utilized for various operations, subject to equipment availability and cost considerations, the following recommendations for minimizing impacts on the surrounding area are offered:

- <u>Earth Removal</u>: Use scrapers as much as possible for earth removal, rather than the noisier loaders and hauling trucks.
- <u>Backfilling</u>: Use a backhoe for backfilling, as it is less costly and quieter than either dozers or loaders.
- <u>Ground Preparation</u>: Use a motor grader rather than a bulldozer for final grading.
- <u>Building Construction</u>: Powers saws should be shielded or enclosed where practical to decrease noise emissions. Nail guns should be used where possible as they are less noisy than manual hammering.
- <u>Construction Phasing:</u> Construct buildings or other significant structures at the site perimeter to help shield existing sensitive receptors from noise generated on the site.

III. Site, Traffic and Project Descriptions

The planned project site is a relatively flat parcel located along East Dunne Avenue at Murphy Avenue in Morgan Hill. The site is currently contains two single-family homes and is approximately at-grade with East Dunne Avenue and Murphy Avenue. Surrounding land uses include vacant land across Murphy Avenue to the west, Nordstrom Park and Nordstrom School across East Dunne Avenue to the south, single-family residential adjacent to the east and the Advent Lutheran Church adjacent to the south.

The on-site noise environment is controlled primarily by traffic sources on East Dunne Avenue which carries an existing (2014) Average Daily Traffic (ADT) volume of 16,004 vehicles. The General Plan Circulation TIA indicates that the traffic volume annual average increase is 0.72% per year based on the reported 2009 volume of 12,040 ADT and the 2030 volume of 14,000 ADT, Ref. (c).

Traffic volume data for Murphy Avenue on Murphy Avenue is estimated to be 2,763 vehicles ADT.

The existing (2014) Highway 101 traffic volume is 122,000 vehicles ADT, as reported by CalTrans, Ref. (d).

The planned project includes the construction of 10 single-family detached homes and two single-family attached (duet) homes. The two existing homes on the site will remain. Ingress and egress to the project will be by way of a new public street off of Murphy Avenue.

IV. Analysis of the Noise Levels

A. Existing Noise Levels

To determine the existing noise environment at the site, continuous recordings of the sound levels were made at two locations. Location 1 was 68 ft. from the centerline of East Dunne Avenue corresponding to the planned minimum building setback from the road. Location 2 was 41 ft. from the centerline of Murphy Avenue at the lot line of Lot 3. The measurements were made on September 24-25, 2015 using Larson-Davis LDL 812 Precision Integrating Sound Level Meters. The meters yield, by direct readout, a series of descriptors of the sound levels versus time, as described in Appendix B. The measured descriptors included the L₁, L₁₀, L₅₀, and L₉₀, i.e., those levels that are exceeded 1%, 10%, 50%, and 90% of the time. Also measured were the maximum and minimum levels, and the continuous equivalent-energy levels (L_{eq}), which are used to calculate the DNL. The measurement locations are shown on Figure 2 on page 13.

The measurements were made for a total period of 24 hours at each location and included recordings of the noise levels during representative hours of the daytime and nighttime periods of the DNL index. The results of the measurements are shown in data tables in Appendix C.

As shown in the tables, the L_{eq} 's at measurement Location 1, 68 ft. from the centerline of East Dunne Avenue, ranged from 61.8 to 66.2 dBA during the daytime and from 50.5 to 60.0 dBA at night.

At measurement Location 2, 41 ft. from the centerline of Murphy Avenue, the L_{eq} 's ranged from 57.5 to 61.6 dBA during the daytime and from 50.2 to 61.0 dBA at night.

The maximum noise levels at measurement Location 1 ranged from 78.4 to 90.5 dBA during the daytime and from 72.6 to 84.0 dBA at night. The maximum noise levels at measurement Location 2 ranged from 70.5 to 92.9 dBA during the daytime and from 67.0 to 78.1 dBA at night.



FIGURE 3 – Noise Measurement Locations

Traffic noise dissipates at the rate of 3 to 6 dB for each doubling of the distance from the source to the receiver. Therefore, other locations on the site at greater distances from the roadways will have lower noise levels.

B. <u>Future Noise Levels</u>

The future (2030) traffic volume data for East Dunne Avenue reported in the City of Morgan Hill Circulation Element is shown to increase from the existing (2009) ADT of 12,040 to 16,004 ADT for 2014. Applying the 0.72% per year growth rate for 2030, the traffic volume is estimated to increase to 17,951 vehicles ADT. This increase in traffic volume yields a 1 decibel increase in the traffic noise levels.

Future traffic volume data for Murphy Avenue are not available. For the purposes of this study, we are assuming that the traffic growth on Murphy Avenue will be similar to the growth on East Dunne Avenue along the site. Thus, the Murphy Avenue traffic volume is predicted to increase from the existing 2,763 ADT to 3,099 ADT. This increase in traffic volume also yields a 1 dB increase in the traffic noise levels.

To determine the future Highway 101 traffic volume, an annual average growth rate was calculated for the past 20 years of traffic volume. The 1994 traffic volume was reported to be 77,000 vehicles ADT, Ref. (e). The existing (2014) traffic volume is 122,000 vehicles ADT. The annual average growth rate over those 20 years was calculated to be 2.337% per year. Applying this growth rate to the future 16 years, the traffic volume for 2030 was calculated to be 176,363 vehicles ADT. This increase in traffic volume yields a 2 dB increase in the Highway 101 traffic noise levels.

V. Evaluation of the Noise Exposures

A. Exterior Noise Exposures

The DNL's for the survey location was calculated by decibel averaging of the L_{eq} 's as they apply to the daily time periods of the DNL index. The DNL is a 24-hour noise descriptor that uses the measured L_{eq} values to calculate a 24-hour time-weighted average noise exposure. The formula used to calculate the DNL is described in Appendix B. Adjustments were applied to the measured noise levels to account for the various setback distances from the measurement locations using methods established by the Highway Research Board, Ref. (f).

The results of the calculations reveal that the existing noise exposure at measurement Location 1, 68 ft. from the centerline of East Dunne Avenue, was calculated to be 65 dB DNL. Under future traffic conditions, the noise exposure is expected to increase to 66 dB DNL.

At the most impacted lot line, 62 ft. from the centerline, the existing noise exposure was calculated to be 66 dB DNL. Under future traffic conditions, the noise exposure is expected to increase to 67 dB DNL. Thus, the noise exposures will be up to 7 dB in excess of the City of Morgan Hill Noise Element standards.

At measurement Location 2, 41 ft. from the centerline of Murphy Avenue, the noise exposure was calculated to be 63 dB DNL, with 58 dB due to Highway 101 traffic, 56 dB due to East Dunne Avenue traffic and 60 dB due to Murphy Avenue traffic.

At the most impacted lot line, 56 ft. from the centerline of Murphy Avenue, the noise exposure was calculated to be 62 dB DNL, with 58 dB due to Highway 101 traffic, 56 dB due to East Dunne Avenue traffic and 58 dB due to Murphy Avenue traffic. Under future traffic conditions, the noise exposure is expected to increase to 64 dB DNL, with 60 dB due to Highway 101 traffic, 57 dB due to East Dunne Avenue traffic and 59 dB due to Murphy Avenue traffic. Thus, the noise exposures will be up to 4 dB in excess of the City of Morgan Hill Noise Element standards.

As the exterior noise exposures exceed the limits of the standards, noise mitigation measures will be required. The recommended measures are described in Section II of this report.

B. Exterior Noise Levels

The exterior maximum noise levels were measured directly by the on-site noise monitoring sound level meter. Table I, below, provide the measured maximum noise levels during the daytime and nighttime periods. Also provided are the averages of the maximum levels for each of the daily sub-periods.

TABLE I								
Exterior Maximum Noise Levels								
	E. Dunne		Murphy Ave					
	Lmax		Lmax					
TIME		TIME						
7:00 AM	80.6	7:00 AM 74.0						
8:00 AM	78.5	8:00 AM	92.9					
9:00 AM	84.7	9:00 AM	73.2					
10:00 AM	82.5	10:00 AM	75.8					
11:00 AM	78.4	11:00 AM	70.5					
12:00 PM	79.3	12:00 PM	75.8					
1:00 PM	84.0	1:00 PM	80.5					
2:00 PM	83.0	2:00 PM	75.9					
3:00 PM	85.5	3:00 PM	79.8					
4:00 PM	85.9	4:00 PM	80.0					
5:00 PM	87.2	5:00 PM	79.7					
6:00 PM	90.5	6:00 PM	79.2					
7:00 PM	81.7	7:00 PM	91.1					
8:00 PM	86.0	8:00 PM	76.3					
9:00 PM	82.5	9:00 PM	81.6					
Average =	83.4	Average =	79.1					
10:00 PM	78.1	10:00 PM	78.1					
11:00 PM	76.1 74.7	11:00 PM	70.1 70.5					
12:00 AM	74.7	12:00 AM	67.5					
1:00 AM	82.3	1:00 AM	75.7					
2:00 AM	72.6	2:00 AM	70.7					
3:00 AM	84.0	3:00 AM	67.0					
4:00 AM	72.9	4:00 AM	67.2					
5:00 AM	82.5	5:00 AM	73.0					
6:00 AM	80.1	6:00 AM	75.0 75.1					
Average =	78.0	Average =	71.6					
, werage -	70.0	, werage -	7 1.0					

As shown in Table I, the average daytime maximum noise level at the most impacted building setback from East Dunne Avenue is 83 (83.4) dBA. The average nighttime maximum noise level is 78.0 dBA.

The average daytime maximum noise level at the most impacted building setback from Murphy Avenue is 79 (79.1) dBA. The average nighttime maximum noise level is 72 (71.6) dBA.

C. <u>Interior Noise Exposures</u>

To determine the interior noise exposures and noise levels in project living spaces, a 25 dB reduction was applied to the exterior noise exposures at the building setbacks to represent the attenuation provided by a typical building shell under a closed window condition. The closed window condition is used in this study as full-time ventilation will be provided that will allow the residents to keep their windows closed for noise control at all times without further specification. This condition also assumes the installation of standard dual-pane thermal insulating windows.

The interior noise exposures in the living spaces closest to East Dunne Avenue will be 40 and 41 dB DNL under existing and future traffic conditions, respectively. Thus, the noise exposures will be within the 45 dB DNL limit of the City of Morgan Hill Noise Element standards.

The interior noise exposures in the living spaces closest to Murphy Avenue but farthest from East Dunne Avenue will be 37 and 39 dB DNL under existing and future traffic conditions, respectively. Thus, the noise exposures will be within the 45 dB DNL limit of the City of Morgan Hill Noise Element standards.

D. <u>Interior Noise Levels</u>

The average interior daytime L_{max} noise levels in the most impacted living spaces closest to East Dunne Avenue will be up to 58 dBA. The average interior daytime L_{max} noise levels in the most impacted living spaces closest to Murphy Avenue will be up to 54 dBA. Thus, the noise levels will be up to 3 dB in excess of the 55 dBA limit of the City of Morgan Hill Noise Element standards for living spaces (during daytime hours).

The average interior nighttime L_{max} noise levels in the most impacted bedrooms closest to East Dunne Avenue will be up to 53 dBA. The average interior nighttime L_{max} noise levels in the most impacted bedrooms closest to Murphy Avenue will be up to 47 dBA. Thus, the noise levels will be up to 3 dB in excess of the 50 dBA limit of the City of Morgan Hill Noise Element standards for bedrooms during nighttime hours.

Table II, below, provides the calculated interior hourly L_{max} levels for the daytime and nighttime periods in the most impacted planned interior spaces of the project. Also provided are the average L_{max} levels for the time periods.

TABLE II								
Interior Maximum Noise Levels								
	E. Dunne	Murphy A						
	Lmax		Lmax					
TIME		TIME						
7:00 AM	55.6	7:00 AM	49.0					
8:00 AM	53.5	8:00 AM	67.9					
9:00 AM	59.7	9:00 AM	48.2					
10:00 AM	57.5	10:00 AM	50.8					
11:00 AM	53.4	11:00 AM	45.5					
12:00 PM	54.3	12:00 PM	50.8					
1:00 PM	59.0	1:00 PM	55.5					
2:00 PM	58.0	2:00 PM	50.9					
3:00 PM	60.5	3:00 PM	54.8					
4:00 PM	60.9	4:00 PM	55.0					
5:00 PM	62.2	5:00 PM	54.7					
6:00 PM	65.5	6:00 PM	54.2					
7:00 PM	56.7	7:00 PM	66.1					
8:00 PM	61.0	8:00 PM	51.3					
9:00 PM	57.5	9:00 PM	56.6					
Average =	58.4	Average =	54.1					
10:00 PM	53.1	10:00 PM	53.1					
11:00 PM	49.7	11:00 PM	45.5					
12:00 AM	49.8	12:00 AM	42.5					
1:00 AM	57.3	1:00 AM	50.7					
2:00 AM	47.6	2:00 AM	45.7					
3:00 AM	59.0	3:00 AM	42.0					
4:00 AM	47.9	4:00 AM	42.2					
5:00 AM	57.5	5:00 AM	48.0					
6:00 AM	55.1	6:00 AM	50.1					
Average =	53.0	Average =	46.6					

As shown above, the interior maximum noise levels will exceed the 55 dBA daytime limit for living spaces by up to 3 dB and will exceed the 50 dBA nighttime limit for bedrooms by up to 3 dB. Noise mitigation measures for certain interior spaces will be required. The recommended measures are described in Section II of this report.

The above report presents a noise assessment study for the planned single-family development at the Busk Property at East Dunne Avenue and Murphy Avenue in Morgan Hill. The study findings for present conditions are based on field measurements and other data and are correct to the best of our knowledge. Future noise exposures were based on information provided by the City of Morgan Hill and CalTrans. Significant deviations in the future traffic volumes or changes in motor vehicle technology, speed limits, noise regulations, or other future changes beyond our control may produce long-range noise results different from our estimates.

If you need any additional information or would like an elaboration on this report, please call me.

Sincerely,

EDWARD L. PACK ASSOC., INC.

My K look

Jeffrey K. Pack President

Attachment: Appendices A, B and C

APPENDIX A

References:

- (a) Preliminary Grading Plan, Dunne Murphy, by MH Engineering, September 2015
- (b) City of Morgan Hill General Plan, Health and Safety Element, "Noise", July 2001
- (c) City of Morgan Hill General Plan Circulation Element Network and Policy Revisions Traffic Impact Analysis, by Fehr & Peers Transportation Consultants, May 2009
- (d) State of California Department of Transportation, Division of Traffic Operations, http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/2014all/Route101.html
- (e) State of California Department of Transportation, Division of Traffic Operations http://traffic-counts.dot.ca.gov/docs/1994_aadt_volumes.pdf
- (f) Highway Research Board, "Highway Noise A Design Guide for Highway Engineers", Report 117, 1971

APPENDIX B

Noise Standards, Terminology and Instrumentation

1. Noise Standards

A. <u>City of Morgan Hill Noise Element Standards</u>

The Public Health and Safety (Noise) Element of the City of Morgan Hill General Plan, adopted July, 2001, contains land use compatibility standards for various land uses. a section on noise.

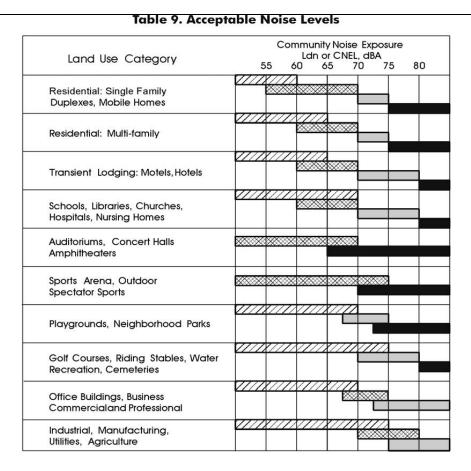
The maximum exterior noise level of 60 dBA L_{dn} shall be applied in residential areas where outdoor use is a major consideration (e.g., rear yards in single family housing developments and recreation areas in multi-family housing projects). Where the City determines that providing an L_{dn} of 60 dBA or lower cannot be achieved after the application of reasonable and feasible mitigation, an L_{dn} of 65 dBA maybe permitted.

- Indoor noise levels should not exceed an L_{dn} of 45 dBA in new residential housing units.
 - Noise levels in new residential development exposed to an exterior L_{dn}

60 dBA or greater should be limited to a maximum instantaneous noise level(e.g., trucks on busy streets, train warning whistles) in bedrooms of 50dBA. Maximum instantaneous noise levels in all other habitable rooms should not exceed 55 dBA.

The maximum outdoor noise level for new residences near the railroad shall be 70 dBA L_{dn} , recognizing that train noise is characterized by relatively few loud events.

The Noise Element references the Land Use Compatibility chart from the State of California Guidelines for the Preparation of a Noise Element. The "Normally Acceptable" standards for the land use categories are as follows:



INTERPRETATION



NORMALLY ACCEPTABLE

Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.



CONDITIONALLY ACCEPTABLE

New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

NORMALLY UNACCEPTABLE

New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

CLEARLY UNACCEPTABLE

New construction or development should generally not be undertaken.

Source: Office of Planning and Research, State of California General Plan Guidelines, Appendix A: Guidelines for the Preparation and Content of the Noise Element of the General Plan, 1990.

2. <u>Terminology</u>

A. <u>Statistical Noise Levels</u>

Due to the fluctuating character of urban traffic noise, statistical procedures are needed to provide an adequate description of the environment. A series of statistical descriptors have been developed which represent the noise levels exceeded a given percentage of the time. These descriptors are obtained by direct readout of the Sound Level Meters. Some of the statistical levels used to describe community noise are defined as follows:

- L₁ A noise level exceeded for 1% of the time.
- L_{10} A noise level exceeded for 10% of the time, considered to be an "intrusive" level.
- L_{50} The noise level exceeded 50% of the time representing the "mean" sound level.
- L_{90} The noise level exceeded 90 % of the time, designated as a "background" noise level.
- $L_{\rm eq}$ The continuous equivalent-energy level is that level of a steady-state noise having the same sound energy as a given time-varying noise. The $L_{\rm eq}$ represents the decibel level of the time-averaged value of sound energy or sound pressure squared and is used to calculate the DNL and CNEL.

B. <u>Day-Night Level (DNL)</u>

Noise levels utilized in the standards are described in terms of the Day-Night Level (DNL). The DNL rating is determined by the cumulative noise exposures occurring over a 24-hour day in terms of A-Weighted sound energy. The 24-hour day is divided into two subperiods for the DNL index, i.e., the daytime period from 7:00 a.m. to 10:00 p.m., and the nighttime period from 10:00 p.m. to 7:00 a.m. A 10 dBA weighting factor is applied (added) to the noise levels occurring during the nighttime period to account for the greater sensitivity of people to noise during these hours. The DNL is calculated from the measured L_{eq} in accordance with the following mathematical formula:

DNL =
$$[(10\log_{10}(10^{\sum Leq(7-10)})) \times 15] + [((10\log_{10}(10^{\sum Leq(10-7))}) + 10) \times 9]]/24$$

C. A-Weighted Sound Level

The decibel measure of the sound level utilizing the "A" weighted network of a sound level meter is referred to as "dBA". The "A" weighting is the accepted standard weighting system used when noise is measured and recorded for the purpose of determining total noise levels and conducting statistical analyses of the environment so that the output correlates well with the response of the human ear.

3. <u>Instrumentation</u>

The on-site field measurement data were acquired by the use of one or more of the sound analyzer listed below. The instrumentation provides a direct readout of the L exceedance statistical levels including the equivalent-energy level (L_{eq}). Input to the meters were provided by microphones extended to a height of 5 ft. above the ground. The "A" weighting network and the "Fast" response setting of the meters were used in conformance with the applicable standards. The Larson-Davis meters were factory modified to conform to the Type 1 performance standards of ANSI S1.4. All instrumentation was acoustically calibrated before and after field tests to assure accuracy.

Bruel & Kjaer 2231 Precision Integrating Sound Level Meter Larson Davis LDL 812 Precision Integrating Sound Level Meter Larson Davis 2900 Real Time Analyzer

4. **Building Shell Controls**

The following additional precautionary measures are required to assure the greatest potential for exterior-to-interior noise attenuation by the recommended mitigation measures. These measures apply at those units where closed windows are required.

- Unshielded entry doors having a direct or side orientation toward the primary noise source must be 1-5/8" or 1-3/4" thick, insulated metal or solid-core wood construction with effective weather seals around the full perimeter.
- If any penetrations in the building shell are required for vents, piping, conduit, etc., sound leakage around these penetrations can be controlled by sealing all cracks and clearance spaces with a non-hardening caulking compound.
- Ventilation devices shall not compromise the acoustical integrity of the building shell.

APPENDIX C

On-Site Noise Measurement Data and Calculation Tables

DNL CALCULATIONS

CLIENT: GEIER & GEIER

FILE: 47-065

PROJECT: BUSK PROPERTY DATE: 9/24-25-2015

SOURCE: E. DUNNE AVE., MURPHY AVE.

LOCATION 1	E. Dunne Ave			LOCATION 2	Murphy Ave.		
Dist. To Source	e 68 ft.			Dist. To Source	41 ft.		
TIME	Leq	10^Leq/10		TIME	Leq	10^Leq/10	
7:00 AM	62.2	1659586.9		7:00 AM	61.3	1348962.9	
8:00 AM	61.8	1513561.2		8:00 AM	63.6	2290867.7	
9:00 AM	62.5	1778279.4		9:00 AM	57.5	562341.3	
10:00 AM	62.9	1949844.6		10:00 AM	59.4	870963.6	
11:00 AM	63.0	1995262.3		11:00 AM	58.2	660693.4	
12:00 PM	63.2	2089296.1		12:00 PM	58.8	758577.6	
1:00 PM	63.8	2398832.9		1:00 PM	59.8	954992.6	
2:00 PM	63.9	2454708.9		2:00 PM	59.4	870963.6	
3:00 PM	64.9	3090295.4		3:00 PM	60.2	1047128.5	
4:00 PM	65.7	3715352.3		4:00 PM	60.8	1202264.4	
5:00 PM	66.2	4168693.8		5:00 PM	61.1	1288249.6	
6:00 PM	65.8	3801894.0		6:00 PM	60.6	1148153.6	
7:00 PM	64.9	3090295.4		7:00 PM	61.6	1445439.8	
8:00 PM	64.2	2630268.0		8:00 PM	58.4	691831.0	
9:00 PM	62.6	1819700.9 SUM=	38155872.3	9:00 PM	59.4	870963.6 SUM=	16012393.1
10:00 PM	60.0	1000000.0 Ld=	75.8	10:00 PM	57.4	549540.9 Ld=	72.0
11:00 PM	57.2	524807.5		11:00 PM	54.4	275422.9	
12:00 AM	55.1	323593.7		12:00 AM	51.4	138038.4	
1:00 AM	55.1	323593.7		1:00 AM	52.1	162181.0	
2:00 AM	50.5	112201.8		2:00 AM	50.2	104712.9	
3:00 AM	51.9	154881.7		3:00 AM	51.0	125892.5	
4:00 AM	53.6	229086.8		4:00 AM	55.0	316227.8	
5:00 AM	57.4	549540.9		5:00 AM	58.4	691831.0	
6:00 AM	59.5	891250.9 SUM=	4108956.9	6:00 AM	61.0	1258925.4 SUM=	3622772.7
		Ln=	66.1			Ln=	65.6
	Daytime Level=	75.8			Daytime Level=	72.0	
	Nighttime Level=	76.1			Nighttime Level=	75.6	
	DNL=	65			DNL=	63	
	24-Hour Leq=	62.5			24-Hour Leq=	59.1	